

United States for resale, and all other actions to comply with the requirements of this part constitute actions or activities covered by and within the meaning of 28 U.S.C. 1605(a)(2), but solely with respect to actions instituted against the foreign nonroad equipment manufacturer, its agents, officers, and employees in any court or other tribunal in the United States for conduct that violates the requirements of part 1039, including such conduct that violates 18 U.S.C. 1001, Clean Air Act section 113(c)(2), or other applicable provisions of the Clean Air Act.

(f) The foreign nonroad equipment manufacturer, or its agents, officers, or employees, will not seek to detain or to impose civil or criminal remedies against EPA inspectors or auditors, whether EPA employees or EPA contractors, for actions performed within the scope of EPA employment related to the provisions of this section.

(g) The commitment required by this section shall be signed by the owner or president of the foreign nonroad equipment manufacturer business.

(h) *Sovereign immunity.* By submitting a notification of its intent to use the flexibility provision under § 1039.625, or by producing and exporting for resale to the United States nonroad equipment under this section, the foreign nonroad equipment manufacturer, its agents, officers, and employees, without exception, become subject to the full operation of the administrative and judicial enforcement powers and provisions of the United States without limitation based on sovereign immunity, with respect to actions instituted against the foreign nonroad equipment manufacturer, its agents, officers, and employees in any court or other tribunal in the United States for conduct that violates the requirements applicable to the foreign nonroad equipment manufacturer under this part, including such conduct that violates 18 U.S.C. 1001, section

113(c)(2) of the Clean Air Act, or other applicable provisions of the Clean Air Act.

(i) *English language reports.* Any report or other document submitted to EPA by any foreign nonroad equipment manufacturer shall be in the English language, or shall include an English language translation.

§ 1039.630 What are the hardship provisions for equipment manufacturers?

If you qualify for the hardship provisions specified in 40 CFR 1068.255, we may approve your hardship application subject to three additional conditions:

(a) You must show that you were selling new equipment with engines that were certified to meet the requirements of 40 CFR part 89 before 2003.

(b) You must show that you have used up the allowances to produce equipment with exempted engines under § 1039.625.

(c) You may produce engines under this section for up to one year total (or two years for small-volume manufacturers).

§ 1039.635 What are the hardship provisions for engine manufacturers?

If you qualify for the hardship provisions specified in 40 CFR 1068.245, we may approve a period of delayed compliance for up to two years total for small-volume manufacturers or one year total for all other companies. If you qualify for the hardship provisions specified in 40 CFR 1068.250 for small-volume manufacturers, we may approve a period of delayed compliance for up to two years total.

§ 1039.639 What special provisions apply to engines sold in Guam, American Samoa, or the Commonwealth of the Northern Mariana Islands?

Engines introduced into commerce in Guam, American Samoa, or the Commonwealth of the Northern Mariana

Islands are subject to the latest emission standards in 40 CFR 89.112 instead of the Tier 4 standards in § 1039.101, but only if the engines include the following statement on the label we require in 40 CFR 89.110 (or on a separate, permanent label with your corporate name and trademark): "THIS ENGINE DOES NOT CONFORM TO U.S. EPA EMISSION REQUIREMENTS IN EFFECT AT THE TIME OF PRODUCTION AND MAY NOT BE IMPORTED INTO THE UNITED STATES OR ANY TERRITORY OF THE UNITED STATES EXCEPT GUAM, AMERICAN SAMOA, OR THE COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS.". Introducing any such engine into commerce in any state or territory of the United States other than Guam, American Samoa, or the Commonwealth of the Northern Mariana Islands, throughout its lifetime, is a violation of 40 CFR 1068.101(a)(1).

§ 1039.645 What special provisions apply to engines used for transportation refrigeration units?

The provisions of this section apply for engines used in transportation refrigeration units (TRUs). All other provisions of this part apply for these engines, except as specified in this section.

(a) Engines used only in TRU applications may be certified using the following special provisions:

(1) The engines are not required to meet the transient emission standards of subpart B of this part.

(2) The steady-state emission standards of subpart B apply for emissions measured over the steady-state test cycle described in paragraph (b) of this section instead of the otherwise applicable test cycle described in Appendix I, III, or IV of this part.

(b) The steady-state test cycle for TRU engines is:

STEADY-STATE CYCLE FOR TRU ENGINES

Mode No.	Engine speed	Observed torque ¹	Minimum time in mode (minutes)	Weighting factors
1	Maximum test speed	75	3.0	0.25
2	Maximum test speed	50	3.0	0.25
3	Intermediate test speed	75	3.0	0.25
4	Intermediate test speed	50	3.0	0.25

¹ The percent torque is relative to the maximum torque at the given engine speed.

(c) Engines certified under this section must be certified in a separate

engine family that contains only TRU engines.

(d) You must do the following for each engine certified under this section:

(1) State on the emission control information label for each engine that is certified under the provisions of this

section: "This engine is certified to operate only in transportation refrigeration units. Use of this the engine in other applications is a violation of federal law subject to civil penalty."

(2) State in the installation instructions required by § 1039.130 all instructions necessary to ensure that the engine will operate only in the modes covered by the test cycle described in this section.

(3) Keep records to document the destinations and quantities of engines produced under this section.

(e) An engine is not a TRU engine that can be certified under this section if any of the following are true:

(1) The engine is installed in any equipment other than refrigeration units for railcars, truck trailers or other freight vehicles.

(2) The engine operates in any mode not covered by the test cycle described in this section, except for negligible transitional operation between two allowable modes. As an example, a thirty-second transition period would clearly not be considered negligible.

(3) The engine is sold in a configuration that allows the engine to operate in any mode not covered by the test cycle described in this section. As an example, this would include an engine sold without a governor that limited operation to only those modes covered by the test cycle described in this section.

(4) The engine is subject to Tier 3 or earlier standards, or phase-out Tier 4 standards.

(f) All engines certified under this section must comply with the NTE requirements of subpart B of this part. This requirement applies without regard to whether the engine would otherwise have been subject to NTE standards if it had not been certified under this section.

Subpart H—Averaging, Banking, and Trading for Certification

§ 1039.701 General provisions.

(a) You may average, bank, and trade (ABT) emission credits for purposes of certification as described in this subpart to show compliance with the standards of this part. Participation in this program is voluntary.

(b) The averaging set restrictions that apply are specified in § 1039.735.

(c) The definitions of Subpart I of this part apply to this subpart. The following definitions also apply:

(1) *Actual credits* means credits you have generated that we have verified in reviewing the final report.

(2) *Broker* means any entity that facilitates a trade between a buyer and seller.

(3) *Buyer* means the entity that receives credits as a result of trade.

(4) *Reserved credits* means credits you have generated that we have not yet verified in reviewing the final report.

(5) *Seller* means the entity that provides credits during a trade.

(6) *Standard* means the standard that applies under subpart B of this part for engines not participating in the ABT program of this subpart.

(d) Credits generated under this subpart cannot be used to offset any exceedances above FEL. This applies for all testing, including certification, SEA, and in-use testing. Note: You may use credits to allow you to recertify the engine family to a higher FEL that would be applicable to future production.

(e) Credits can be used in the year they are generated or in future years. Credits may not be used for past model years.

(f) Engine families that use credits for one or more pollutants, may not generate positive credits for another pollutant.

§ 1039.705 How do I generate and calculate emission credits?

The provisions of this section apply separately for calculating NO_x credits, NMHC+ NO_x credits, or PM credits.

(a) Calculate positive credits for an engine family that has an FEL below the applicable standard. Calculate negative credits for an engine family that has an FEL above the applicable standard.

(b) For each participating engine family, calculate NO_x emission credits, NMHC+ NO_x emission credits and/or PM emission credits (positive or negative) according to the following equation. Round them to the nearest one-hundredth of a megagram (Mg), using consistent units throughout the equation:

$$\text{Emission credits} = (\text{Std} - \text{FEL}) \times (\text{Volume}) \times (\text{AvgPR}) \div (\text{UL} \times 10^{-6})$$

Where:

Std = the standard, in grams per kilowatt-hour, that applies under subpart B of this part for engines not participating in the ABT program of this subpart.

FEL = the family emission limit for the engine family in grams per kilowatt-hour.

Volume = the number of nonroad engines eligible to participate in the averaging, banking, and trading program within the given engine family during the model year, as described in paragraph (c) of this section.

AvgPR = the average maximum engine power of all of the configurations within an engine family, calculated on a sales-weighted basis, in kilowatts.

UL = the useful life for the given engine family, in hours.

(c) Use quarterly projections of production volumes for initial certification. Compliance at the end of the model year is determined based on the actual applicable production/sales volumes. Do not include any of the following engines in your applicable production/sales volumes:

(1) Engines exempted under subpart G of this part or under part 1068.

(2) Exported engines.

(3) Engines not subject to the requirements of this part, including engines excluded under § 1039.5.

(4) Engines certified using special test procedures under 40 CFR 1065.10. (Note: this restriction does not apply for engines certified using alternate test procedures under 40 CFR 1065.10.)

(5) Any other engines, where we indicate elsewhere in this part 1039 that they are not to be included in the calculations of this subpart.

§ 1039.710 How do I average?

(a) Averaging is the exchange of emissions credits among engine families.

(b) You may certify one or more engine families to an FEL above or below the applicable standard if you show, at the time of certification, that the summation of your projected balance of all emissions credit transactions in that model year is greater than or equal to zero.

(c) If you certify an engine family to an FEL that exceeds the applicable standard, you must obtain sufficient emissions credits to offset the credit shortfall produced by the engine family. Emissions credits used in averaging to address this shortfall may come from emissions credits generated from your other engine families in the same model year, from banked emissions credits, or from emissions credits obtained through trading.

§ 1039.715 How do I bank emission credits?

(a) Banking is the retention of emissions credits by the manufacturer generating the emissions credits, for use in averaging or trading in future model years.

(b) In your application for certification, designate any emissions credits that you intend to bank. These credits will be considered reserved

credits. During the model year, and before submittal of the end-of-year report, credits originally designated for banking may be redesignated for trading or averaging for the end-of-year report or final report.

(c) Credits designated for banking from the previous model year that have not been reviewed by EPA may be used in averaging or trading transactions. However, such credits may be revoked at a later time following EPA review of the end-of-year or final report or any subsequent audit actions.

(d) Banked credits are considered actual credits only after the end of the model year and after EPA has reviewed the end-of-year and final reports.

§ 1039.720 How do I trade emissions credits?

(a) Trading is the exchange of emissions credits between manufacturers. Trading of emissions credits may only occur within the same averaging set.

(b) You may trade actual or reserved credits. Credits banked in a previous model year or credits generated during the model year of the trading transaction may be used for trading. Traded reserved credits, such as those generated during the model year of the trading transaction, remain reserved until we verify them after the end of the model year. Traded credits may be used for averaging, banking, or further trading transactions.

(c) If a negative credit balance results from a transaction, both the buyer and seller are liable, except in cases deemed involving fraud. Certificates of all engine families participating in a negative trade may be voided under § 1039.740.

§ 1039.725 What records must I keep?

(a) Establish, maintain and keep the following properly organized and indexed records for each engine family certified using the ABT program in this subpart:

(1) Model year and EPA engine family.

(2) FELs.

(3) Useful life.

(4) Maximum engine power for each configuration tested.

(5) Projected applicable production/sales volume for the model year.

(6) Actual applicable production/sales volume for the model year.

(b) Establish, maintain and keep the following properly organized and indexed records for each engine in the ABT program:

(1) Model year and EPA engine family.

(2) Engine identification number.

(3) Maximum engine power.

(4) Build date and assembly plant.

(5) Purchaser and destination.

(c) Manufacturers involved in trading reserved credits must maintain the records specified in this paragraph (c) for each engine family in the trading program. We may ask you to provide this information on a quarterly basis. This requirement applies with respect to the following information:

(1) The engine family.

(2) The actual quarterly and cumulative applicable production/sales volume.

(3) All values required to calculate credits.

(4) The resulting type and number of credits generated/required.

(5) How and where credit surpluses are dispersed.

(6) How and through what means credit deficits are met.

(d) Keep the records required by this section for eight years from the due date for the end-of-year report. You may use any appropriate storage formats or media, including paper, microfilm, or computer diskettes.

(e) Nothing in this section limits our discretion in requiring the manufacturer to retain additional records or submit information not specifically required by this section.

(f) Upon request, you must submit to us the information specified in this section.

§ 1039.730 What must I include in my application for certification?

(a) You must declare in your application your intent to use the provisions of this subpart for each engine family that will be certified using the ABT program. You must also declare for which pollutants you are using ABT, and declare the FELs for your engine family for those pollutants. Your FELs must comply with the specifications of subpart B of this part, including the FEL caps. FELs must be expressed to the same number of decimal places as the applicable standards.

(b) Include the following in your application for certification:

(1) A statement that, to the best of your belief, you will not have a negative credit balance for any engine family when all credits are calculated.

(2) Detailed calculations of projected emission credits (positive or negative) based on quarterly projections of applicable production/sales volume. If your engine family will generate positive emission credits, state specifically where the credits will be applied (e.g., to which engine family they will be applied in averaging, trading, or if they will be reserved for

banking). If you have negative emission credits for your engine family, state the source of positive credits needed to offset the negative credits. Describe the source of credits by indicating from which engine family (and manufacturer, as applicable), and by specifying whether the credits are actual or reserved and whether they come from banking, trading, or from averaging with your other engine families within the model year.

§ 1039.732 What reports must I submit after the end of the model year?

This section specifies the requirements for submitting the end-of-year report and the final report. This section specifies in paragraph (g) an additional report that must be submitted if you are involved in a trade of credits.

(a)(1) If any of your engine families are certified using the ABT provisions of this subpart, you must submit the end-of-year report within 90 days of the end of the model year. The end-of-year report must include the information specified in this section. We may waive the requirement to submit the end-of-year report, provided you submit the final report specified in paragraph (a)(2) of this section.

(2) If any of your engine families are certified using the ABT provisions of this subpart, you must submit the final report within 270 days of the end of the model year. The final report must include the information specified in this section.

(b) Failure to submit reports on time is a violation of the Act with respect to each engine.

(c) Your end-of-year and final reports must identify the engine families for which they apply and must include:

(i) Detailed calculation of emission credits (positive or negative) based on actual applicable production/sales volumes. Base your applicable production/sales volumes on the location of first retail sale. This location is also called the final product purchase location. A dealership is a typical location for the first retail sale.

(ii) Demonstrate that you have the positive credits needed to offset any negative credits.

(iii) State whether you will reserve any credits for banking.

(d) Send end-of-year reports to the Designated Compliance Officer.

(e) If you generate credits for banking and you do not send your end-of-year reports within 90 days after the end of the model year, you may not use the credits until we receive and review your reports. You may not use projected credits pending our review.

(f) Errors discovered in your end-of-year report or final report, including errors in calculating credits, are corrected as follows:

(1) Any errors discovered in the end-of-year report may be corrected in the final report up to 270 days from the end of the model year.

(2) Errors discovered by the manufacturer in the final report may be corrected up to 270 days from the end of the model year, and credits will be recalculated.

(3) If we or you determine within 270 days of the end of the model year, that an error occurred that mistakenly decreased your positive credits, the error will be corrected and credits will be recalculated. Such errors will not be corrected if they are determined more than 270 days from the end of the model year.

(4) In cases where credit balance is negative, if we determine that an error occurred that mistakenly decreased your balance of credits, we may, but are not required to, correct the error and recalculate the credits. This applies

whether or not the error was discovered by you.

(5) If we determine at any time, that an error occurred that mistakenly increased your balance of credits, we will correct the error and recalculate the credits to decrease your balance. This applies whether or not the error was discovered by you.

(g) If you trade credits, you must send the Designated Compliance Officer a report of the trade, within 90 days of any credit trade, that includes the following information:

(1) The corporate names of the buyer, seller, and any brokers.

(2) Copies of contracts related to credit trading from the buyer, seller, and broker, as applicable.

(3) The engine families involved in the trade.

(4) The actual quarterly and cumulative applicable production/sales volume.

(5) The values required to calculate credits as given in § 1039.705.

(6) The resulting type and number of credits generated.

(7) How and where credit surpluses are dispersed; and

(8) How and through what means credit deficits are met.

(h) Include in each report a statement certifying the accuracy and authenticity of its contents.

§ 1039.735 What restrictions apply for using credits?

The following restrictions apply for credit use:

(a) *Averaging sets.* Credits may be exchanged only within an averaging set. For Tier 4 engines, there is a single averaging set that includes all power categories. See paragraph (b) for provisions related to credits generated relative to earlier tiers of standards.

(b) *Credits from a different tier of standards.* (1) For purposes of ABT under this subpart, you may not use credits generated from engines subject to emission standards under 40 CFR part 89, except as specified in the following table:

If the power rating of the credit-generating engine is . . .	Then you may use the following credits for Tier 4 compliance . . .
(i) Less than 37 kW	Credits from engines subject to emission standards in 89.112(a) Table 1, identified as Tier 2.
(ii) At least 37 kW, but less than 560 kW.	Credits from engines subject to emission standards in 89.112(a) Table 1, identified as Tier 3.
(iii) 560 kW or higher	Credits from engines subject to emission standards in 89.112(a) Table 1, identified as Tier 2.

(2) Credits generated from marine engines under the provisions of 40 CFR part 89 may not be used under this part.

(3) Credits generated from nonmarine engines under the provisions of 40 CFR part 89 allowed to be used under this part are subject to the averaging set restrictions described in 40 CFR 89.204. This means that credits generated by engines at or above 19 kW may not be used by engines less than 19 kW, and credits generated by engines less than 19 kW may not be used by engines at or above 19 kW.

(4) See 40 CFR part 89 for other restrictions that may apply for use of credits generated under that part.

(c) *NO_x and NMHC + NO_x credits.* You may use NO_x credits to show compliance with NMHC+NO_x standards. You may use NMHC+NO_x credits to show compliance with NO_x standards, but you must adjust the NMHC+NO_x credits downward by twenty percent when you use them, as shown in the following equation:

NO_x credits = (0.8) × (NMHC+NO_x credits).

(d) *Other restrictions.* Other sections of this part may include ABT restrictions for engines certified under

certain special provisions. Those restrictions apply as specified.

§ 1039.740 What can happen if I do not comply with the provisions of this subpart?

(a)(1) All certificates issued for engine family participating in this ABT program are conditional upon your full compliance with the provisions of this subpart during the model year of production and afterwards.

(2) Failure to comply with any provisions of this subpart will be deemed to be a failure to satisfy the conditions upon which the certificate was issued, and the certificate may be voided.

(3) By choosing to participate in this ABT program, you are responsible to establish to EPA's satisfaction that the conditions under which the certificate was issued were satisfied or waived.

(b) You may certify your engine family to an FEL above a applicable standard based on a projection that you will have sufficient credits to offset the credit deficit for the engine family. However, if you cannot show in your final report that you have sufficient actual credits to offset a credit deficit for any engine family, we may void the

certificate of conformity for the engine family.

(c) We may void the certificate of conformity for an engine family for which you fail to retain the records required in this subpart or to provide such information to us upon request.

Subpart I—Definitions and Other Reference Information

§ 1039.801 What definitions apply to this part?

The following definitions apply to this part. The definitions apply to all subparts unless we note otherwise. All undefined terms have the meaning the Act gives to them. The definitions follow:

Act means the Clean Air Act, as amended, 42 U.S.C. 7401 *et seq.*

Adjustable parameter means any device, system, or element of design that someone can adjust (including those which are difficult to access) and that, if adjusted, may affect emissions or engine performance during emission testing or normal in-use operation. This includes, but is not limited to parameters related to injection timing and fueling rate. You may ask us to exclude a parameter that is difficult to

access if it cannot be adjusted to affect emissions without significantly degrading performance, or if you otherwise show us that it will not be adjusted in a way that affects emissions during in-use operation.

Aftertreatment means relating to any system, component, or technology mounted downstream of the exhaust valve or exhaust port whose design function is to reduce exhaust emissions.

Aircraft has the meaning given in 40 CFR 87.1.

Auxiliary emission control device means any element of design that senses temperature, motive speed, engine RPM, transmission gear, or any other parameter for the purpose of activating, modulating, delaying, or deactivating the operation of any part of the emission control system.

Blue Sky Series engine means an engine meeting the requirements of § 1039.140.

Brake power means the usable power output of the engine, not including power required to operate fuel pumps, oil pumps, or coolant pumps.

Broker means any entity that facilitates a trade of emission credits between a buyer and seller.

Calibration means the set of specifications and tolerances specific to a particular design, version, or application of a component or assembly capable of functionally describing its operation over its working range.

Certification means obtaining a certificate of conformity for an engine family that complies with the emission standards and requirements in this part.

Certified emission level means the highest deteriorated emission level in an engine family for a given pollutant from either transient or steady-state testing.

Compression-ignition means relating to a type of reciprocating, internal-combustion engine that is not a spark-ignition engine.

Constant-speed means relating to an engine governed to operate at rated speed.

Crankcase emissions means airborne substances emitted to the atmosphere from any part of the engine crankcase's ventilation or lubrication systems. The crankcase is the housing for the crankshaft and other related internal parts.

Designated Compliance Officer means the Manager, Engine Programs Group (6405-J), U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., Washington, DC 20460.

Designated Enforcement Officer means the Director, Air Enforcement Division (2242A), U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460.

Deteriorated emission level means the emission level that results from applying the applicable deterioration factor to the official emission result of the emission-data engine.

Deterioration factor means a number that is added to or multiplied by a low-hour test result to project the emission rate at the end of the useful life.

Emission-control system means any device, system, or element of design that controls or reduces the regulated emissions from an engine.

Emission-data engine means an engine that is tested for certification.

Emission-related maintenance means maintenance that substantially affects emissions or is likely to substantially affect emissions deterioration.

Engine family means a group of engines with similar emission characteristics, as specified in § 1039.230.

Engine manufacturer means the manufacturer of the engine. See the definition of "manufacturer" in this section.

Engine used in a locomotive means either an engine placed in the locomotive to move other equipment, freight, or passenger traffic; or an engine mounted on the locomotive to provide auxiliary power.

Exempted means relating to an engine that is not required to meet otherwise applicable standards because the engine conforms to regulatory conditions specified for an exemption in this part 1039 or in part 1068 of this chapter. Exempted engines are deemed to be "subject to" the standards of this part, even though they are not required to comply with the otherwise applicable requirements. Engines exempted with respect to a certain tier of standards may be required to comply with an earlier tier of standards as a condition of the exemption; for example, engines exempted with respect to Tier 4 standards may be required to comply with Tier 3 standards.

Excluded means relating to an engine that either:

- (1) Has been determined not to be a nonroad engine, as specified in 40 CFR 1068.30; or
- (2) Is a nonroad engine that, according to § 1039.5, is not subject to this part 1039.

Exhaust-gas recirculation means an emission-control technology that reduces emissions by routing exhaust gases that had been exhausted from the combustion chamber(s) back into the engine to be mixed with incoming air prior to or during combustion. The use of valve timing to increase the amount of residual exhaust gas in the combustion chamber(s) that is mixed

with incoming air prior to or during combustion is not considered to be exhaust-gas recirculation for the purposes of this part.

Family emission limit (FEL) means an emission level declared by the manufacturer to serve in place of an emission standard for certification under the emission-credit program in subpart H of this part. The family emission limit must be expressed to the same number of decimal places as the emission standard it replaces.

Fuel system means all components involved in transporting, metering, and mixing the fuel from the fuel tank to the combustion chamber(s), including the fuel tank, fuel tank cap, fuel pump, fuel filters, fuel lines, carburetor or fuel-injection components, and all fuel-system vents.

Fuel type means a general category of fuels such as diesel fuel or natural gas. There can be multiple grades within a single type of fuel, such as No. 1 diesel and No. 2 diesel.

Good engineering judgment has the meaning we give in 40 CFR 1068.5.

Hydrocarbon (HC) means the hydrocarbon group on which the emission standards are based for each fuel type. For petroleum-fueled engines and natural gas-fueled engines, HC means nonmethane hydrocarbon (NMHC). For alcohol-fueled engines, HC means total hydrocarbon equivalent (THCE).

Identification number means a unique specification (for example, model number/serial number combination) that allows someone to distinguish a particular engine from other similar engines.

Intermediate test speed has the meaning we give in 40 CFR 1065.515.

Manufacture means the physical and engineering process of designing, constructing, and assembling of a nonroad engine or a piece of nonroad equipment.

Manufacturer has the meaning given in section 216(1) of the Act. In general, this term includes any person who manufactures an engine, vehicle, or piece of equipment for sale in the United States or otherwise introduces a new nonroad engine into commerce in the United States. This includes importers who import engines, equipment, or vehicles for resale. (Note: In § 1039.626, the term "equipment manufacturer" has a more narrow meaning; that narrow meaning only applies to that section.)

Marine engine means an engine that someone installs or intends to install on a marine vessel. There are two kinds of marine engines:

(1) *Propulsion marine engine* means a marine engine that moves a vessel through the water or directs the vessel's movement.

(2) *Auxiliary marine engine* means a marine engine not used for propulsion.

Marine vessel means a vehicle that is capable of operation in water but is not capable of operation out of water. Amphibious vehicles are not marine vessels.

Maximum engine power means the measured maximum brake power output of an engine. The maximum engine power of an engine configuration is the average maximum engine power of the engines within the configuration. The maximum engine power of an engine family is the highest maximum engine power of the engine configurations within the family. (Note: § 1039.230 generally prohibits grouping engines from different power categories in the same engine family.)

Maximum test speed has the meaning we give in 40 CFR 1065.515.

Maximum test torque has the meaning we give in 40 CFR 1065.1001.

Model year means one of the following things:

(1) For freshly manufactured engines (see definition of "new nonroad engine," paragraph (1)), model year means one of the following:

(i) Calendar year.

(ii) Your annual new model production period if it is different than the calendar year. This must include January 1 of the calendar year for which the model year is named. It may not begin before January 2 of the previous calendar year and it must end by December 31 of the named calendar year.

(2) For an engine that is converted to a nonroad engine after being placed into service in a motor vehicle, model year means the calendar year in which the engine was originally produced (see definition of "new nonroad engine," paragraph (2)).

(3) For a nonroad engine excluded under § 1039.5 that is later converted to operate in an application that is not excluded, model year means the calendar year in which the engine was originally produced (see definition of "new nonroad engine," paragraph (3)).

(4) For engines that are not freshly manufactured but are installed in new nonroad equipment, model year means the calendar year in which the engine is installed in the new nonroad equipment. This installation date is based on the time that final assembly of the equipment is complete (see definition of "new nonroad engine," paragraph (4)).

(5) For an engine modified by an importer (not the original engine manufacturer) who has a certificate of conformity for the imported engine (see definition of "new nonroad engine," paragraph (5)), model year means one of the following:

(i) The calendar year in which the importer finishes modifying and labeling the engine.

(ii) Your annual production period for producing engines if it is different than the calendar year; follow the guidelines in paragraph (1)(ii) of this definition.

(6) For an engine you import that does not meet the criteria in paragraphs (1) through (5) of the definition of "new nonroad engine," model year means the calendar year in which the engine manufacturer completed the original assembly of the engine. In general, this applies to used equipment that you import without conversion or major modification.

Motor vehicle has the meaning we give in 40 CFR 85.1703(a). In general, *motor vehicle* means a self-propelled vehicle that can transport one or more people or any material, but doesn't include any of the following:

(1) Vehicles having a maximum ground speed over level, paved surfaces no higher than 40 km per hour (25 miles per hour).

(2) Vehicles that lack features usually needed for safe, practical use on streets or highways—for example, safety features required by law, a reverse gear (except for motorcycles), or a differential.

(3) Vehicles whose operation on streets or highways would be unsafe, impractical, or highly unlikely. Examples are vehicles with tracks instead of wheels, very large size, or features associated with military vehicles, such as armor or weaponry.

New nonroad engine means any of the following things:

(1) A freshly manufactured nonroad engine for which the ultimate purchaser has never received the equitable or legal title. This kind of vehicle might commonly be thought of as "brand new." In the case of this paragraph (1), the engine is no longer new when the ultimate purchaser receives this title or the product is placed into service, whichever comes first.

(2) An engine originally manufactured as a motor vehicle engine that is later intended to be used in a piece of nonroad equipment. In this case, the engine is no longer a motor vehicle engine and becomes a "new nonroad engine". The engine is no longer new when it is placed into nonroad service.

(3) A nonroad engine that has been previously placed into service in an

application we exclude under § 1039.5, where that engine is installed in a piece of equipment for which these exclusions do not apply. The engine is no longer new when it is placed into nonroad service. For example, this would apply to a stationary engine that is no longer used in a stationary application.

(4) An engine not covered by paragraphs (1) through (3) of this definition that is intended to be installed in new nonroad equipment. The engine is no longer new when the ultimate purchaser receives a title for the equipment or the product is placed into service, whichever comes first. This generally includes installation of used engines in new equipment.

(5) An imported nonroad engine covered by a certificate of conformity issued under this part, where someone other than the original engine manufacturer modifies the engine after its initial assembly and holds the certificate. The engine is no longer new when it is placed into nonroad service.

(6) An imported nonroad engine that is not covered by a certificate of conformity issued under this part at the time of importation. This addresses uncertified engines and vehicles that have been placed into service in other countries and that someone seeks to import into the United States. Importation of this kind of new nonroad engine (or vehicle containing such an engine) is generally prohibited by 40 CFR part 1068.

New nonroad equipment means either of the following things:

(1) A nonroad vehicle or other piece of equipment for which the ultimate purchaser has never received the equitable or legal title. The product is no longer new when the ultimate purchaser receives this title or the product is placed into service, whichever comes first.

(2) An imported nonroad piece of equipment with an engine not covered by a certificate of conformity issued under this part at the time of importation and manufactured after the date for applying the requirements of this part.

Noncommercial fuel means a fuel that is not marketed or sold as a commercial product. For example, this includes methane produced and released from landfills or oil wells.

Noncompliant engine means an engine that was originally covered by a certificate of conformity, but is not in the certified configuration or otherwise does not comply with the conditions of the certificate.

Nonconforming engine means an engine not covered by a certificate of

conformity that would otherwise be subject to emission standards.

Nonmethane hydrocarbon means the difference between the emitted mass of total hydrocarbons and the emitted mass of methane.

Nonroad means relating to nonroad engines or equipment that includes nonroad engines.

Nonroad engine has the meaning given in 40 CFR 1068.30. In general this means all internal-combustion engines except motor vehicle engines, stationary engines, or engines used solely for competition. This part does not apply to all nonroad engines (see § 1039.5).

Nonroad equipment means a vehicle or piece of equipment that is powered by one or more nonroad engines.

Nonroad equipment manufacturer means any person engaged in manufacturing or assembling new nonroad vehicles or equipment or importing such vehicles or equipment for resale. This includes any person who acts for and is under the control of any such person in connection with distributing such vehicles or equipment. A nonroad vehicle or equipment manufacturer does not include any dealer with respect to new nonroad vehicles or equipment received by such person in commerce. A nonroad equipment manufacturer does not include any person engaged in the manufacturing or assembling of new nonroad vehicles or equipment who does not install an engine as part of that manufacturing or assembling process. All nonroad vehicle or equipment manufacturing entities under the control of the same person are considered to be a single nonroad equipment manufacturer.

Official emission result means the measured emission rate for a test engine on a given duty cycle before the application of any deterioration factor, but after the applicability of regeneration adjustment factors.

Opacity means the fraction of a beam of light, expressed in percent, which fails to penetrate a plume of smoke.

Oxides of nitrogen has the meaning given it in 40 CFR part 1065.

Particulate trap means a filtering device that is designed to physically trap all particulate matter above a certain size.

Placed into service means used for its intended purpose.

Point of first retail sale means the location at which the retail sale occurs. This generally means a dealership.

Power category means a specific range maximum engine power that defines the applicability of standards. For example, the 56–130 kW power category includes all engines with maximum power of at

least 56 kW but less than 130 kW. See § 1039.101 for a list of specific power categories. (Note: In some cases, FEL caps are based on subcategories of power categories.)

Rated speed means the maximum full load governed speed for governed engines and the speed of maximum horsepower for ungoverned engines.

Revoke means to discontinue the certificate for an engine family. If we revoke a certificate, you must apply for a new certificate before continuing to produce the affected engines. This does not apply to engines you no longer possess.

Round means to round numbers according to ASTM E29–02 (incorporated by reference in § 1039.810), unless otherwise specified.

Scheduled maintenance means adjusting, repairing, removing, disassembling, cleaning, or replacing components or systems that is periodically needed to keep a part from failing or malfunctioning. It also may mean actions you expect are necessary to correct an overt indication of failure or malfunction for which periodic maintenance is not appropriate.

Small-volume engine manufacturer means an engine manufacturer that had engine families certified to meet the requirements of 40 CFR part 89 before 2003 and had annual U.S.-directed production of no more than 2,500 units in 2002 and all earlier calendar years. For manufacturers owned by a parent company, the limit applies to the production of the parent company and all of its subsidiaries.

Spark-ignition means relating to a gasoline-fueled engine or any other type of engine with a spark plug (or other sparking device) and with operating characteristics significantly similar to the theoretical Otto combustion cycle. Spark-ignition engines usually use a throttle to regulate intake air flow to control power during normal operation.

Suspend means to temporarily discontinue the certificate for an engine family. If we suspend a certificate, you may not sell engines from that engine family unless we reinstate the certificate or approve a new one.

Test engine means an engine in a test sample.

Test sample means the collection of engines selected from the population of an engine family for emission testing.

Tier 1 means relating to the Tier 1 emission standards, as shown in 40 CFR 89.112.

Tier 2 means relating to the Tier 2 emission standards, as shown in 40 CFR 89.112.

Tier 3 means relating to the Tier 3 emission standards, as shown in 40 CFR 89.112.

Tier 4 means relating to the Tier 4 emission standards, as shown in § 1039.101. This includes the emission standards for all pollutants if an engine is subject to Tier 4 emission standards for any pollutant. For example, this includes the Tier 3 HC+NO_x standard during the phase-in period when engines are subject to the Tier 4 PM standard.

Total hydrocarbon means the combined mass organic compounds measured by our total hydrocarbon test procedure, expressed as a hydrocarbon with a hydrogen-to-carbon mass ratio of 1.85:1.

Total hydrocarbon equivalent means the sum of the carbon mass contributions of non-oxygenated hydrocarbons, alcohols and aldehydes, or other organic compounds that are measured separately as contained in a gas sample, expressed as petroleum-fueled engine hydrocarbons. The hydrogen-to-carbon ratio of the equivalent hydrocarbon is 1.85:1.

Ultimate purchaser means, with respect to any new nonroad equipment or new nonroad engine, the first person who in good faith purchases such new nonroad equipment or new nonroad engine for purposes other than resale.

United States means the States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, Guam, American Samoa, and the U.S. Virgin Islands.

Upcoming model year means for an engine family the model year after the one currently in production.

U.S.-directed production volume means the number of engine units, subject to the requirements of this part, produced by a manufacturer for which the manufacturer has a reasonable assurance that sale was or will be made to ultimate purchasers in the United States.

Useful life means the period during which the engine is designed to properly function in terms of reliability and fuel consumption, without being remanufactured, specified as a number of hours of operation or calendar years. It is the period during which a new nonroad engine is required to comply with all applicable emission standards. See § 1039.101(g).

Variable-speed engine means an engine that is not a constant-speed engine.

Void means to invalidate a certificate or an exemption. If we void a certificate, all the engines produced under that engine family for that model year are

considered noncompliant, and you are liable for each engine produced under the certificate and may face civil or criminal penalties or both. This applies equally to all engines in the engine family including engines produced before we voided the certificate. If we void an exemption, all the engines produced under that exemption are considered uncertified (or nonconforming), and you are liable for each engine produced under the exemption and may face civil or criminal penalties or both. You may not produce any additional engines using the voided exemption.

Volatile liquid fuel means any fuel other than diesel or biodiesel that is a liquid at atmospheric pressure and has a Reid Vapor Pressure higher than 2.0 psi.

We (us, our) means the Administrator of the Environmental Protection Agency and any authorized representatives.

§ 1039.805 What symbols, acronyms, and abbreviations does this part use?

The following symbols, acronyms, and abbreviations apply to this part: °C degrees Celsius.

ASTM American Society for Testing and Materials.

cc cubic centimeters.

CFR Code of Federal Regulations.

CI compression-ignition.

cm centimeter.

CO carbon monoxide.

CO₂ carbon dioxide.

EPA Environmental Protection Agency.

FEL Family Emission Limit.

g/kW-hr grams per kilowatt-hour.

HC hydrocarbon.

ISO International Organization for Standardization.

kPa kilopascals.

kW kilowatts.

m meters.

MIL malfunction-indicator light.

mm Hg millimeters of mercury.

NMHC nonmethane hydrocarbons.

NO_x oxides of nitrogen (NO and NO₂).

psi pounds per square inch of absolute pressure.

psig pounds per square inch of gauge pressure.

rpm revolutions per minute.

SAE Society of Automotive Engineers.

SI spark-ignition.

THC total hydrocarbon.

THCE total hydrocarbon equivalent.

TRU transportation refrigeration unit

U.S.C. United States Code.

§ 1039.810 What materials does this part reference?

We have incorporated by reference the documents listed in this section. The Director of the Federal Register approved the incorporation by reference as prescribed in 5 U.S.C. 552(a) and 1 CFR part 51. Anyone may inspect copies at the U.S. EPA, Air and Radiation Docket and Information Center, 1301 Constitution Ave., NW., Room B102, EPA West Building, Washington, DC 20460 or the Office of the Federal Register, 800 N. Capitol St., NW., 7th Floor, Suite 700, Washington, DC.

(a) *ASTM material.* Table 1 of § 1039.810 lists material from the American Society for Testing and Materials that we have incorporated by reference. The first column lists the number and name of the material. The second column lists the sections of this part where we reference it. Anyone may purchase copies of these materials from the American Society for Testing and Materials, 100 Barr Harbor Dr., West Conshohocken, PA 19428. Table 1 follows:

TABLE 1 OF § 1039.810.—ASTM MATERIALS

Document number and name	Part 1039 reference
ASTM E29–02, Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications.	1039.801

(b) *SAE material.* Table 2 of § 1039.810 lists material from the Society of Automotive Engineering that we have incorporated by reference. The first column lists the number and name of the material. The second column lists the sections of this part where we reference it. Anyone may purchase copies of these materials from the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096. Table 2 follows:

TABLE 2 OF § 1039.810.—SAE MATERIALS

Document number and name	Part 1039 reference
SAE J1930, Electrical/Electronic Systems Diagnostic Terms, Definitions, Abbreviations, and Acronyms, May 1998.	1039.135

§ 1039.815 How should I request EPA to keep my information confidential?

(a) Clearly show what you consider confidential by marking, circling, bracketing, stamping, or some other method. We will store your confidential information as described in 40 CFR part 2. Also, we will disclose it only as specified in 40 CFR part 2.

(b) If you send us a second copy without the confidential information, we will assume it contains nothing confidential whenever we need to release information from it.

(c) If you send us information without claiming it is confidential, we may make it available to the public without further

notice to you, as described in 40 CFR 2.204.

§ 1039.820 How do I request a hearing?

See 40 CFR part 1068, subpart G, for information related to hearings.

APPENDIX I TO PART 1039.—NONROAD COMPRESSION-IGNITION (CI) STEADY-STATE CYCLE FOR CONSTANT-SPEED ENGINES

Mode No.	Engine speed	Torque ¹	Minimum time in mode (minutes)	Weighting factors
1	Maximum test	100	3.0	0.05
2	Maximum test	75	3.0	0.25
3	Maximum test	50	3.0	0.30
4	Maximum test	25	3.0	0.30

APPENDIX I TO PART 1039.—NONROAD COMPRESSION-IGNITION (CI) STEADY-STATE CYCLE FOR CONSTANT-SPEED ENGINES—Continued

Mode No.	Engine speed	Torque ¹	Minimum time in mode (minutes)	Weighting factors
5	Maximum test	10	3.0	0.10

¹ The percent torque is relative to the maximum torque at maximum test speed.

Appendix II to Part 1039—[Reserved]

APPENDIX III TO PART 1039.—NONROAD COMPRESSION-IGNITION (CI) STEADY-STATE CYCLE FOR VARIABLE-SPEED ENGINES WITH MAXIMUM POWER BELOW 19 kW

Mode No.	Engine speed	Observed torque ¹	Minimum time in mode (minutes)	Weighting factors
1	Maximum test speed	100	3.0	0.09
2	Maximum test speed	75	3.0	0.20
3	Maximum test speed	50	3.0	0.29
4	Maximum test speed	25	3.0	0.30
5	Maximum test speed	10	3.0	0.07
6	Idle	0	3.0	0.05

¹ The percent torque is relative to the maximum torque at maximum test speed.

APPENDIX IV TO PART 1039.—NONROAD COMPRESSION-IGNITION (CI) STEADY-STATE CYCLE FOR VARIABLE-SPEED ENGINES WITH MAXIMUM POWER AT OR ABOVE 19 kW

Mode No.	Engine speed	Observed torque ¹	Minimum time in mode (minutes)	Weighting factors
1	Maximum test speed	100	3.0	0.15
2	Maximum test speed	75	3.0	0.15
3	Maximum test speed	50	3.0	0.15
4	Maximum test speed	10	3.0	0.10
5	Intermediate test speed	100	3.0	0.10
6	Intermediate test speed	75	3.0	0.10
7	Intermediate test speed	50	3.0	0.10
8	Idle	0	3.0	0.15

¹ The percent torque is relative to the maximum torque at the given engine speed.

APPENDIX V TO PART 1039.—NONROAD COMPRESSION-IGNITION (CI) TRANSIENT CYCLE FOR CONSTANT-SPEED ENGINES

APPENDIX V TO PART 1039.—NONROAD COMPRESSION-IGNITION (CI) TRANSIENT CYCLE FOR CONSTANT-SPEED ENGINES—Continued

APPENDIX V TO PART 1039.—NONROAD COMPRESSION-IGNITION (CI) TRANSIENT CYCLE FOR CONSTANT-SPEED ENGINES—Continued

Time (s)	Normalized speed (percent)	Normalized torque (percent)	Time (s)	Normalized speed (percent)	Normalized torque (percent)	Time (s)	Normalized speed (percent)	Normalized torque (percent)
1	58	5	16	58	5	31	93	20
2	58	5	17	58	5	32	94	20
3	58	5	18	58	5	33	94	22
4	58	5	19	58	5	34	94	23
5	58	5	20	58	5	35	93	23
6	58	5	21	65	8	36	93	25
7	58	5	22	72	11	37	93	24
8	58	5	23	79	14	38	94	23
9	58	5	24	86	17	39	93	21
10	58	5	25	93	20	40	94	21
11	58	5	26	93	20	41	96	22
12	58	5	27	93	20	42	95	19
13	58	5	28	93	20	43	95	14
14	58	5	29	93	20	44	95	10
15	58	5	30	93	20	45	93	50

APPENDIX V TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) TRANSIENT CYCLE FOR CON-
STANT-SPEED ENGINES—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
46	93	36
47	93	29
48	93	26
49	95	29
50	95	26
51	95	18
52	95	14
53	95	10
54	95	9
55	93	42
56	93	42
57	93	35
58	93	29
59	93	28
60	93	28
61	93	25
62	93	28
63	93	26
64	93	26
65	95	24
66	95	17
67	95	13
68	95	10
69	95	9
70	94	51
71	93	45
72	93	42
73	94	40
74	93	30
75	93	27
76	93	25
77	93	23
78	93	22
79	94	21
80	93	20
81	95	20
82	95	19
83	95	14
84	95	11
85	95	9
86	95	8
87	95	7
88	95	7
89	95	6
90	95	6
91	95	6
92	95	6
93	81	5
94	93	53
95	93	43
96	93	35
97	93	34
98	93	29
99	93	26
100	93	25
101	93	23
102	93	21
103	93	20
104	93	20
105	94	19
106	94	21
107	94	22
108	93	21
109	93	22
110	93	23
111	93	22

APPENDIX V TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) TRANSIENT CYCLE FOR CON-
STANT-SPEED ENGINES—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
112	93	22
113	94	20
114	93	20
115	93	20
116	93	19
117	94	20
118	94	21
119	93	23
120	94	23
121	93	23
122	93	21
123	93	19
124	94	23
125	94	22
126	94	21
127	94	23
128	94	24
129	93	23
130	94	39
131	94	40
132	94	34
133	94	34
134	94	32
135	94	32
136	94	30
137	94	27
138	94	29
139	94	35
140	94	41
141	94	43
142	94	42
143	94	46
144	94	37
145	94	34
146	94	29
147	94	27
148	94	27
149	94	28
150	94	29
151	93	30
152	93	27
153	94	29
154	95	27
155	95	19
156	95	14
157	95	11
158	95	9
159	95	8
160	95	7
161	95	7
162	95	6
163	95	6
164	95	6
165	93	5
166	59	5
167	58	6
168	58	6
169	58	6
170	58	6
171	58	6
172	58	6
173	58	6
174	58	6
175	58	6
176	58	6
177	58	6

APPENDIX V TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) TRANSIENT CYCLE FOR CON-
STANT-SPEED ENGINES—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
178	58	50
179	94	49
180	93	41
181	94	36
182	93	35
183	94	28
184	93	24
185	93	21
186	93	24
187	93	25
188	93	28
189	94	29
190	93	40
191	94	33
192	93	29
193	93	29
194	93	23
195	93	24
196	93	21
197	93	32
198	93	29
199	94	32
200	93	32
201	93	28
202	94	35
203	93	30
204	94	27
205	94	26
206	94	23
207	93	31
208	94	27
209	94	23
210	94	28
211	94	41
212	93	56
213	93	43
214	93	37
215	93	35
216	94	33
217	93	29
218	94	25
219	94	23
220	94	23
221	94	20
222	94	29
223	94	34
224	93	27
225	94	28
226	94	34
227	93	34
228	94	29
229	92	49
230	94	43
231	94	39
232	94	35
233	93	54
234	94	50
235	94	40
236	94	33
237	94	37
238	94	41
239	93	31
240	94	25
241	94	22
242	94	22
243	94	26

APPENDIX V TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) TRANSIENT CYCLE FOR CON-
STANT-SPEED ENGINES—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
244	94	26
245	94	34
246	96	30
247	95	71
248	94	52
249	93	42
250	93	40
251	93	32
252	94	31
253	94	27
254	94	27
255	94	28
256	93	24
257	94	23
258	94	28
259	93	29
260	93	23
261	93	26
262	94	21
263	93	21
264	93	24
265	94	25
266	94	25
267	94	34
268	93	35
269	93	27
270	93	23
271	93	26
272	93	23
273	93	25
274	94	23
275	93	22
276	94	26
277	94	26
278	93	29
279	94	29
280	94	28
281	94	23
282	94	45
283	93	37
284	94	29
285	94	28
286	95	27
287	95	19
288	95	14
289	95	11
290	95	9
291	95	8
292	95	7
293	93	52
294	93	42
295	93	40
296	93	35
297	94	35
298	93	36
299	94	39
300	94	38
301	94	30
302	94	35
303	94	35
304	94	36
305	94	30
306	93	27
307	94	27
308	94	33
309	94	29

APPENDIX V TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) TRANSIENT CYCLE FOR CON-
STANT-SPEED ENGINES—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
310	94	25
311	94	28
312	95	26
313	94	95
314	94	101
315	93	92
316	93	64
317	93	49
318	94	41
319	93	37
320	93	31
321	94	26
322	94	36
323	93	29
324	93	23
325	93	21
326	94	28
327	93	26
328	94	35
329	93	51
330	94	43
331	93	33
332	93	29
333	96	27
334	95	22
335	93	64
336	93	46
337	93	37
338	93	31
339	93	33
340	94	33
341	93	30
342	93	26
343	93	34
344	93	37
345	94	29
346	94	27
347	93	36
348	95	30
349	95	22
350	95	16
351	95	12
352	95	10
353	94	43
354	93	34
355	94	28
356	94	34
357	94	28
358	93	33
359	94	31
360	94	41
361	94	31
362	93	26
363	94	25
364	94	23
365	94	27
366	94	23
367	94	23
368	93	22
369	94	23
370	94	49
371	93	40
372	94	37
373	94	32
374	93	26
375	94	23

APPENDIX V TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) TRANSIENT CYCLE FOR CON-
STANT-SPEED ENGINES—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
376	94	26
377	94	28
378	93	30
379	93	25
380	94	24
381	94	23
382	94	22
383	94	20
384	94	22
385	94	25
386	93	36
387	93	40
388	94	35
389	93	33
390	93	29
391	93	27
392	93	23
393	93	23
394	93	23
395	94	23
396	93	21
397	93	22
398	94	22
399	94	23
400	94	23
401	93	24
402	94	23
403	93	20
404	93	21
405	93	22
406	93	23
407	94	23
408	93	22
409	93	21
410	93	23
411	94	23
412	93	21
413	93	21
414	93	20
415	94	19
416	94	21
417	94	21
418	93	19
419	93	22
420	94	21
421	94	23
422	94	25
423	94	26
424	94	34
425	94	28
426	94	24
427	94	24
428	94	25
429	94	23
430	94	24
431	94	25
432	94	26
433	94	25
434	94	26
435	94	25
436	94	23
437	93	23
438	94	21
439	93	19
440	94	18
441	93	19

APPENDIX V TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) TRANSIENT CYCLE FOR CON-
STANT-SPEED ENGINES—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
442	94	20
443	94	21
444	94	20
445	94	21
446	94	20
447	93	46
448	93	39
449	94	32
450	96	28
451	95	24
452	95	17
453	95	13
454	95	10
455	95	9
456	95	8
457	95	7
458	95	7
459	95	6
460	95	6
461	95	6
462	80	5
463	79	44
464	94	33
465	93	27
466	93	30
467	94	41
468	93	33
469	93	28
470	93	27
471	94	30
472	93	30
473	93	28
474	93	29
475	93	23
476	93	22
477	93	30
478	94	31
479	94	33
480	94	29
481	93	32
482	93	25
483	93	22
484	93	26
485	94	23
486	93	19
487	93	20
488	93	29
489	94	23
490	93	23
491	94	33
492	93	39
493	94	39
494	93	36
495	93	36
496	94	32
497	94	27
498	93	23
499	96	32
500	95	72
501	93	56
502	93	46
503	93	38
504	92	62
505	94	49
506	94	44
507	93	59

APPENDIX V TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) TRANSIENT CYCLE FOR CON-
STANT-SPEED ENGINES—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
508	93	40
509	96	30
510	93	70
511	93	47
512	96	39
513	94	66
514	93	49
515	94	36
516	94	68
517	93	56
518	93	42
519	92	67
520	94	47
521	93	56
522	94	86
523	93	56
524	96	39
525	93	57
526	93	43
527	92	68
528	93	49
529	95	35
530	93	55
531	93	43
532	93	73
533	93	76
534	95	60
535	95	44
536	92	68
537	94	81
538	93	73
539	93	57
540	94	46
541	94	71
542	93	57
543	93	54
544	93	46
545	95	38
546	93	56
547	93	41
548	94	33
549	92	69
550	93	48
551	93	40
552	92	67
553	93	46
554	93	36
555	96	31
556	93	61
557	94	50
558	94	40
559	92	64
560	93	49
561	94	34
562	92	62
563	93	48
564	94	36
565	92	62
566	93	48
567	93	42
568	93	69
569	93	55
570	94	42
571	93	30
572	94	25
573	93	23

APPENDIX V TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) TRANSIENT CYCLE FOR CON-
STANT-SPEED ENGINES—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
574	93	22
575	93	28
576	93	23
577	93	21
578	93	23
579	95	23
580	93	47
581	93	42
582	93	34
583	93	30
584	93	47
585	93	34
586	93	59
587	93	51
588	93	37
589	93	29
590	93	23
591	93	31
592	93	26
593	94	25
594	93	21
595	93	29
596	93	24
597	93	28
598	93	27
599	93	24
600	93	21
601	93	20
602	93	24
603	93	26
604	93	31
605	93	26
606	93	25
607	93	27
608	93	26
609	93	23
610	94	32
611	93	29
612	93	33
613	92	52
614	94	63
615	93	48
616	95	38
617	95	26
618	95	18
619	95	14
620	95	10
621	95	9
622	92	40
623	95	31
624	95	23
625	93	59
626	93	47
627	94	43
628	94	48
629	94	37
630	93	31
631	93	29
632	94	26
633	93	23
634	93	21
635	93	26
636	94	24
637	93	23
638	94	20
639	93	17

APPENDIX V TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) TRANSIENT CYCLE FOR CON-
STANT-SPEED ENGINES—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
640	93	16
641	93	17
642	93	15
643	93	19
644	93	19
645	93	19
646	93	21
647	93	23
648	93	24
649	93	23
650	93	23
651	94	20
652	93	19
653	94	20
654	93	21
655	93	22
656	95	23
657	95	18
658	95	13
659	95	10
660	95	9
661	95	8
662	95	7
663	95	7
664	95	6
665	95	6
666	95	6
667	95	6
668	66	5
669	57	6
670	58	6
671	58	6
672	58	6
673	58	6
674	58	6
675	58	6
676	58	6
677	58	6
678	58	6
679	58	6
680	58	6
681	58	6
682	58	6
683	58	6
684	58	6
685	58	6
686	58	6
687	58	6
688	58	6
689	58	6
690	58	6
691	58	6
692	58	6
693	58	6
694	58	6
695	58	6
696	58	6
697	74	55
698	93	45
699	93	36
700	93	29
701	93	23
702	93	26
703	93	24
704	93	20
705	93	19

APPENDIX V TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) TRANSIENT CYCLE FOR CON-
STANT-SPEED ENGINES—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
706	93	20
707	93	24
708	93	25
709	93	21
710	93	19
711	93	17
712	93	16
713	93	20
714	93	17
715	93	20
716	93	22
717	93	22
718	93	25
719	93	42
720	93	30
721	93	26
722	93	22
723	93	24
724	93	20
725	93	18
726	93	18
727	93	19
728	93	17
729	93	17
730	94	23
731	93	21
732	93	20
733	93	17
734	93	16
735	93	15
736	93	19
737	93	19
738	93	20
739	93	20
740	93	20
741	93	19
742	93	20
743	93	18
744	93	18
745	93	18
746	93	16
747	93	18
748	93	20
749	93	25
750	93	25
751	93	22
752	93	21
753	93	18
754	93	19
755	96	23
756	95	19
757	95	14
758	95	10
759	95	9
760	95	8
761	95	7
762	95	7
763	95	6
764	95	6
765	92	53
766	93	38
767	93	30
768	96	30
769	93	65
770	94	76
771	93	53

APPENDIX V TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) TRANSIENT CYCLE FOR CON-
STANT-SPEED ENGINES—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
772	93	43
773	93	33
774	93	29
775	93	33
776	96	28
777	95	69
778	93	64
779	93	55
780	93	43
781	93	32
782	93	30
783	93	42
784	93	33
785	93	31
786	93	24
787	93	23
788	93	24
789	93	20
790	93	24
791	93	26
792	93	24
793	93	27
794	93	24
795	93	22
796	93	19
797	93	16
798	93	15
799	93	14
800	93	17
801	93	22
802	93	23
803	93	21
804	93	18
805	93	21
806	93	18
807	93	18
808	93	17
809	96	18
810	95	17
811	95	13
812	94	69
813	93	54
814	93	40
815	93	29
816	93	24
817	93	31
818	93	27
819	93	29
820	93	23
821	93	23
822	93	21
823	93	18
824	93	24
825	93	22
826	93	21
827	93	18
828	93	21
829	93	19
830	93	23
831	93	29
832	93	41
833	93	37
834	93	29
835	93	24
836	93	21
837	93	23

APPENDIX V TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) TRANSIENT CYCLE FOR CON-
STANT-SPEED ENGINES—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
838	93	20
839	93	18
840	93	17
841	93	18
842	93	19
843	93	22
844	93	21
845	93	21
846	93	19
847	93	19
848	93	18
849	93	19
850	93	17
851	93	16
852	93	19
853	93	18
854	94	24
855	93	25
856	93	25
857	93	21
858	93	17
859	96	19
860	95	18
861	93	54
862	93	61
863	93	43
864	93	31
865	93	24
866	93	23
867	93	22
868	93	21
869	93	20
870	93	16
871	93	16
872	93	16
873	93	31
874	93	30
875	93	27
876	93	23
877	93	23
878	93	21
879	93	20
880	93	18
881	93	16
882	93	18
883	93	16
884	93	17
885	93	20
886	93	20
887	93	22
888	93	20
889	93	17
890	93	17
891	93	17
892	93	16
893	93	18
894	93	18
895	93	21
896	93	21
897	93	18
898	94	24
899	93	28
900	93	23
901	93	19
902	93	20
903	93	20

APPENDIX V TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) TRANSIENT CYCLE FOR CON-
STANT-SPEED ENGINES—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
904	93	29
905	93	23
906	93	25
907	93	23
908	93	23
909	93	23
910	93	21
911	93	21
912	93	22
913	93	30
914	93	33
915	93	25
916	93	29
917	93	27
918	93	23
919	93	21
920	93	21
921	93	19
922	93	20
923	93	24
924	93	23
925	93	21
926	93	44
927	93	34
928	93	28
929	93	37
930	93	29
931	93	27
932	93	33
933	93	28
934	93	22
935	96	30
936	95	25
937	95	17
938	95	13
939	95	10
940	95	9
941	95	8
942	95	7
943	95	7
944	95	6
945	95	6
946	93	37
947	93	34
948	93	29
949	93	23
950	93	23
951	93	21
952	93	20
953	93	29
954	93	27
955	93	26
956	93	35
957	93	43
958	95	35
959	95	24
960	95	17
961	95	13
962	95	10
963	95	9
964	95	8
965	95	7
966	95	7
967	95	6
968	93	36
969	93	30

APPENDIX V TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) TRANSIENT CYCLE FOR CON-
STANT-SPEED ENGINES—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
970	93	25
971	93	21
972	93	22
973	93	19
974	93	34
975	93	36
976	93	31
977	93	26
978	93	27
979	93	21
980	93	22
981	93	18
982	93	18
983	93	19
984	93	19
985	93	23
986	93	22
987	93	20
988	93	23
989	93	20
990	93	18
991	93	18
992	93	16
993	93	19
994	94	25
995	93	30
996	93	29
997	93	23
998	93	24
999	93	22
1000	94	20
1001	93	17
1002	93	16
1003	93	16
1004	93	15
1005	93	17
1006	93	18
1007	93	20
1008	93	21
1009	93	18
1010	93	17
1011	92	54
1012	93	38
1013	93	29
1014	93	24
1015	93	24
1016	93	24
1017	93	23
1018	93	20
1019	93	20
1020	93	18
1021	93	19
1022	93	19
1023	93	16
1024	93	16
1025	93	16
1026	93	17
1027	93	21
1028	93	20
1029	93	20
1030	93	17
1031	93	19
1032	93	16
1033	93	18
1034	93	16
1035	93	16

APPENDIX V TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) TRANSIENT CYCLE FOR CON-
STANT-SPEED ENGINES—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
1036	93	16
1037	93	17
1038	93	16
1039	93	17
1040	93	18
1041	93	17
1042	93	16
1043	93	17
1044	93	17
1045	93	22
1046	93	19
1047	93	19
1048	95	21
1049	95	16
1050	95	12
1051	95	10
1052	96	8
1053	96	7
1054	95	7
1055	96	7
1056	95	6
1057	96	6
1058	96	6
1059	88	5
1060	89	49
1061	93	34
1062	93	27
1063	93	26
1064	93	25
1065	93	22
1066	93	23
1067	93	21
1068	93	21
1069	93	23
1070	93	23
1071	93	23
1072	93	23
1073	93	23
1074	93	22
1075	93	22
1076	93	24
1077	93	23
1078	93	23
1079	93	21
1080	93	19
1081	93	20
1082	93	20
1083	93	22
1084	93	26
1085	93	21
1086	93	20
1087	93	18
1088	93	22
1089	93	20
1090	94	27
1091	93	22
1092	93	23
1093	93	21
1094	93	22
1095	95	22
1096	95	16
1097	95	12
1098	95	10
1099	95	9
1100	95	7
1101	96	7

APPENDIX V TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) TRANSIENT CYCLE FOR CON-
STANT-SPEED ENGINES—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
1102	95	7
1103	95	6
1104	92	42
1105	93	36
1106	93	33
1107	92	60
1108	93	48
1109	93	36
1110	93	30
1111	93	28
1112	93	24
1113	93	24
1114	93	23
1115	93	23
1116	93	25
1117	93	27
1118	93	29
1119	93	26
1120	93	26
1121	93	21
1122	93	23
1123	93	23
1124	94	23
1125	93	40
1126	94	67
1127	93	46
1128	93	38
1129	93	29
1130	93	28
1131	93	27
1132	93	29
1133	93	28
1134	94	33
1135	93	31
1136	93	30
1137	94	42
1138	93	31
1139	93	29
1140	93	27
1141	93	23
1142	93	23
1143	93	20
1144	93	20
1145	93	23
1146	93	22
1147	93	23
1148	93	25
1149	93	20
1150	93	25
1151	93	23
1152	93	23
1153	93	24
1154	93	28
1155	93	23
1156	93	24
1157	93	34
1158	93	31
1159	93	35
1160	93	31
1161	93	32
1162	93	31
1163	93	30
1164	93	23
1165	93	23
1166	93	36
1167	93	32

APPENDIX V TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) TRANSIENT CYCLE FOR CON-
STANT-SPEED ENGINES—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
1168	93	25
1169	93	31
1170	93	33
1171	93	33
1172	93	33
1173	93	33
1174	93	33
1175	93	33
1176	86	28
1177	79	21
1178	72	16
1179	65	10
1180	58	5
1181	58	5
1182	58	5
1183	58	5
1184	58	5
1185	58	5
1186	58	5
1187	58	5
1188	58	5
1189	58	5
1190	58	5
1191	58	5
1192	58	5
1193	58	5
1194	58	5
1195	58	5
1196	58	5
1197	58	5
1198	58	5
1199	58	5

APPENDIX VI TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) COMPOSITE TRANSIENT CYCLE

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0

APPENDIX VI TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) COMPOSITE TRANSIENT
CYCLE—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
24	1	3
25	1	3
26	1	3
27	1	3
28	1	3
29	1	3
30	1	6
31	1	6
32	2	1
33	4	13
34	7	18
35	9	21
36	17	20
37	33	42
38	57	46
39	44	33
40	31	0
41	22	27
42	33	43
43	80	49
44	105	47
45	98	70
46	104	36
47	104	65
48	96	71
49	101	62
50	102	51
51	102	50
52	102	46
53	102	41
54	102	31
55	89	2
56	82	0
57	47	1
58	23	1
59	1	3
60	1	8
61	1	3
62	1	5
63	1	6
64	1	4
65	1	4
66	0	6
67	1	4
68	9	21
69	25	56
70	64	26
71	60	31
72	63	20
73	62	24
74	64	8
75	58	44
76	65	10
77	65	12
78	68	23
79	69	30
80	71	30
81	74	15
82	71	23
83	73	20
84	73	21
85	73	19
86	70	33
87	70	34
88	65	47
89	66	47

APPENDIX VI TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) COMPOSITE TRANSIENT
CYCLE—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
90	64	53
91	65	45
92	66	38
93	67	49
94	69	39
95	69	39
96	66	42
97	71	29
98	75	29
99	72	23
100	74	22
101	75	24
102	73	30
103	74	24
104	77	6
105	76	12
106	74	39
107	72	30
108	75	22
109	78	64
110	102	34
111	103	28
112	103	28
113	103	19
114	103	32
115	104	25
116	103	38
117	103	39
118	103	34
119	102	44
120	103	38
121	102	43
122	103	34
123	102	41
124	103	44
125	103	37
126	103	27
127	104	13
128	104	30
129	104	19
130	103	28
131	104	40
132	104	32
133	101	63
134	102	54
135	102	52
136	102	51
137	103	40
138	104	34
139	102	36
140	104	44
141	103	44
142	104	33
143	102	27
144	103	26
145	79	53
146	51	37
147	24	23
148	13	33
149	19	55
150	45	30
151	34	7
152	14	4
153	8	16
154	15	6
155	39	47

APPENDIX VI TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) COMPOSITE TRANSIENT
CYCLE—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
156	39	4
157	35	26
158	27	38
159	43	40
160	14	23
161	10	10
162	15	33
163	35	72
164	60	39
165	55	31
166	47	30
167	16	7
168	0	6
169	0	8
170	0	8
171	0	2
172	2	17
173	10	28
174	28	31
175	33	30
176	36	0
177	19	10
178	1	18
179	0	16
180	1	3
181	1	4
182	1	5
183	1	6
184	1	5
185	1	3
186	1	4
187	1	4
188	1	6
189	8	18
190	20	51
191	49	19
192	41	13
193	31	16
194	28	21
195	21	17
196	31	21
197	21	8
198	0	14
199	0	12
200	3	8
201	3	22
202	12	20
203	14	20
204	16	17
205	20	18
206	27	34
207	32	33
208	41	31
209	43	31
210	37	33
211	26	18
212	18	29
213	14	51
214	13	11
215	12	9
216	15	33
217	20	25
218	25	17
219	31	29
220	36	66
221	66	40

APPENDIX VI TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) COMPOSITE TRANSIENT
CYCLE—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
222	50	13
223	16	24
224	26	50
225	64	23
226	81	20
227	83	11
228	79	23
229	76	31
230	68	24
231	59	33
232	59	3
233	25	7
234	21	10
235	20	19
236	4	10
237	5	7
238	4	5
239	4	6
240	4	6
241	4	5
242	7	5
243	16	28
244	28	25
245	52	53
246	50	8
247	26	40
248	48	29
249	54	39
250	60	42
251	48	18
252	54	51
253	88	90
254	103	84
255	103	85
256	102	84
257	58	66
258	64	97
259	56	80
260	51	67
261	52	96
262	63	62
263	71	6
264	33	16
265	47	45
266	43	56
267	42	27
268	42	64
269	75	74
270	68	96
271	86	61
272	66	0
273	37	0
274	45	37
275	68	96
276	80	97
277	92	96
278	90	97
279	82	96
280	94	81
281	90	85
282	96	65
283	70	96
284	55	95
285	70	96
286	79	96
287	81	71

APPENDIX VI TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) COMPOSITE TRANSIENT
CYCLE—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
288	71	60
289	92	65
290	82	63
291	61	47
292	52	37
293	24	0
294	20	7
295	39	48
296	39	54
297	63	58
298	53	31
299	51	24
300	48	40
301	39	0
302	35	18
303	36	16
304	29	17
305	28	21
306	31	15
307	31	10
308	43	19
309	49	63
310	78	61
311	78	46
312	66	65
313	78	97
314	84	63
315	57	26
316	36	22
317	20	34
318	19	8
319	9	10
320	5	5
321	7	11
322	15	15
323	12	9
324	13	27
325	15	28
326	16	28
327	16	31
328	15	20
329	17	0
330	20	34
331	21	25
332	20	0
333	23	25
334	30	58
335	63	96
336	83	60
337	61	0
338	26	0
339	29	44
340	68	97
341	80	97
342	88	97
343	99	88
344	102	86
345	100	82
346	74	79
347	57	79
348	76	97
349	84	97
350	86	97
351	81	98
352	83	83
353	65	96

APPENDIX VI TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) COMPOSITE TRANSIENT
CYCLE—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
354	93	72
355	63	60
356	72	49
357	56	27
358	29	0
359	18	13
360	25	11
361	28	24
362	34	53
363	65	83
364	80	44
365	77	46
366	76	50
367	45	52
368	61	98
369	61	69
370	63	49
371	32	0
372	10	8
373	17	7
374	16	13
375	11	6
376	9	5
377	9	12
378	12	46
379	15	30
380	26	28
381	13	9
382	16	21
383	24	4
384	36	43
385	65	85
386	78	66
387	63	39
388	32	34
389	46	55
390	47	42
391	42	39
392	27	0
393	14	5
394	14	14
395	24	54
396	60	90
397	53	66
398	70	48
399	77	93
400	79	67
401	46	65
402	69	98
403	80	97
404	74	97
405	75	98
406	56	61
407	42	0
408	36	32
409	34	43
410	68	83
411	102	48
412	62	0
413	41	39
414	71	86
415	91	52
416	89	55
417	89	56
418	88	58
419	78	69

APPENDIX VI TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) COMPOSITE TRANSIENT
CYCLE—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
420	98	39
421	64	61
422	90	34
423	88	38
424	97	62
425	100	53
426	81	58
427	74	51
428	76	57
429	76	72
430	85	72
431	84	60
432	83	72
433	83	72
434	86	72
435	89	72
436	86	72
437	87	72
438	88	72
439	88	71
440	87	72
441	85	71
442	88	72
443	88	72
444	84	72
445	83	73
446	77	73
447	74	73
448	76	72
449	46	77
450	78	62
451	79	35
452	82	38
453	81	41
454	79	37
455	78	35
456	78	38
457	78	46
458	75	49
459	73	50
460	79	58
461	79	71
462	83	44
463	53	48
464	40	48
465	51	75
466	75	72
467	89	67
468	93	60
469	89	73
470	86	73
471	81	73
472	78	73
473	78	73
474	76	73
475	79	73
476	82	73
477	86	73
478	88	72
479	92	71
480	97	54
481	73	43
482	36	64
483	63	31
484	78	1
485	69	27

APPENDIX VI TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) COMPOSITE TRANSIENT
CYCLE—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
486	67	28
487	72	9
488	71	9
489	78	36
490	81	56
491	75	53
492	60	45
493	50	37
494	66	41
495	51	61
496	68	47
497	29	42
498	24	73
499	64	71
500	90	71
501	100	61
502	94	73
503	84	73
504	79	73
505	75	72
506	78	73
507	80	73
508	81	73
509	81	73
510	83	73
511	85	73
512	84	73
513	85	73
514	86	73
515	85	73
516	85	73
517	85	72
518	85	73
519	83	73
520	79	73
521	78	73
522	81	73
523	82	72
524	94	56
525	66	48
526	35	71
527	51	44
528	60	23
529	64	10
530	63	14
531	70	37
532	76	45
533	78	18
534	76	51
535	75	33
536	81	17
537	76	45
538	76	30
539	80	14
540	71	18
541	71	14
542	71	11
543	65	2
544	31	26
545	24	72
546	64	70
547	77	62
548	80	68
549	83	53
550	83	50
551	83	50

APPENDIX VI TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) COMPOSITE TRANSIENT
CYCLE—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
552	85	43
553	86	45
554	89	35
555	82	61
556	87	50
557	85	55
558	89	49
559	87	70
560	91	39
561	72	3
562	43	25
563	30	60
564	40	45
565	37	32
566	37	32
567	43	70
568	70	54
569	77	47
570	79	66
571	85	53
572	83	57
573	86	52
574	85	51
575	70	39
576	50	5
577	38	36
578	30	71
579	75	53
580	84	40
581	85	42
582	86	49
583	86	57
584	89	68
585	99	61
586	77	29
587	81	72
588	89	69
589	49	56
590	79	70
591	104	59
592	103	54
593	102	56
594	102	56
595	103	61
596	102	64
597	103	60
598	93	72
599	86	73
600	76	73
601	59	49
602	46	22
603	40	65
604	72	31
605	72	27
606	67	44
607	68	37
608	67	42
609	68	50
610	77	43
611	58	4
612	22	37
613	57	69
614	68	38
615	73	2
616	40	14
617	42	38

APPENDIX VI TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) COMPOSITE TRANSIENT
CYCLE—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
618	64	69
619	64	74
620	67	73
621	65	73
622	68	73
623	65	49
624	81	0
625	37	25
626	24	69
627	68	71
628	70	71
629	76	70
630	71	72
631	73	69
632	76	70
633	77	72
634	77	72
635	77	72
636	77	70
637	76	71
638	76	71
639	77	71
640	77	71
641	78	70
642	77	70
643	77	71
644	79	72
645	78	70
646	80	70
647	82	71
648	84	71
649	83	71
650	83	73
651	81	70
652	80	71
653	78	71
654	76	70
655	76	70
656	76	71
657	79	71
658	78	71
659	81	70
660	83	72
661	84	71
662	86	71
663	87	71
664	92	72
665	91	72
666	90	71
667	90	71
668	91	71
669	90	70
670	90	72
671	91	71
672	90	71
673	90	71
674	92	72
675	93	69
676	90	70
677	93	72
678	91	70
679	89	71
680	91	71
681	90	71
682	90	71
683	92	71

APPENDIX VI TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) COMPOSITE TRANSIENT
CYCLE—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
684	91	71
685	93	71
686	93	68
687	98	68
688	98	67
689	100	69
690	99	68
691	100	71
692	99	68
693	100	69
694	102	72
695	101	69
696	100	69
697	102	71
698	102	71
699	102	69
700	102	71
701	102	68
702	100	69
703	102	70
704	102	68
705	102	70
706	102	72
707	102	68
708	102	69
709	100	68
710	102	71
711	101	64
712	102	69
713	102	69
714	101	69
715	102	64
716	102	69
717	102	68
718	102	70
719	102	69
720	102	70
721	102	70
722	102	62
723	104	38
724	104	15
725	102	24
726	102	45
727	102	47
728	104	40
729	101	52
730	103	32
731	102	50
732	103	30
733	103	44
734	102	40
735	103	43
736	103	41
737	102	46
738	103	39
739	102	41
740	103	41
741	102	38
742	103	39
743	102	46
744	104	46
745	103	49
746	102	45
747	103	42
748	103	46
749	103	38

APPENDIX VI TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) COMPOSITE TRANSIENT
CYCLE—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
750	102	48
751	103	35
752	102	48
753	103	49
754	102	48
755	102	46
756	103	47
757	102	49
758	102	42
759	102	52
760	102	57
761	102	55
762	102	61
763	102	61
764	102	58
765	103	58
766	102	59
767	102	54
768	102	63
769	102	61
770	103	55
771	102	60
772	102	72
773	103	56
774	102	55
775	102	67
776	103	56
777	84	42
778	48	7
779	48	6
780	48	6
781	48	7
782	48	6
783	48	7
784	67	21
785	105	59
786	105	96
787	105	74
788	105	66
789	105	62
790	105	66
791	89	41
792	52	5
793	48	5
794	48	7
795	48	5
796	48	6
797	48	4
798	52	6
799	51	5
800	51	6
801	51	6
802	52	5
803	52	5
804	57	44
805	98	90
806	105	94
807	105	100
808	105	98
809	105	95
810	105	96
811	105	92
812	104	97
813	100	85
814	94	74
815	87	62

APPENDIX VI TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) COMPOSITE TRANSIENT
CYCLE—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
816	81	50
817	81	46
818	80	39
819	80	32
820	81	28
821	80	26
822	80	23
823	80	23
824	80	20
825	81	19
826	80	18
827	81	17
828	80	20
829	81	24
830	81	21
831	80	26
832	80	24
833	80	23
834	80	22
835	81	21
836	81	24
837	81	24
838	81	22
839	81	22
840	81	21
841	81	31
842	81	27
843	80	26
844	80	26
845	81	25
846	80	21
847	81	20
848	83	21
849	83	15
850	83	12
851	83	9
852	83	8
853	83	7
854	83	6
855	83	6
856	83	6
857	83	6
858	83	6
859	76	5
860	49	8
861	51	7
862	51	20
863	78	52
864	80	38
865	81	33
866	83	29
867	83	22
868	83	16
869	83	12
870	83	9
871	83	8
872	83	7
873	83	6
874	83	6
875	83	6
876	83	6
877	83	6
878	59	4
879	50	5
880	51	5
881	51	5

APPENDIX VI TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) COMPOSITE TRANSIENT
CYCLE—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
882	51	5
883	50	5
884	50	5
885	50	5
886	50	5
887	50	5
888	51	5
889	51	5
890	51	5
891	63	50
892	81	34
893	81	25
894	81	29
895	81	23
896	80	24
897	81	24
898	81	28
899	81	27
900	81	22
901	81	19
902	81	17
903	81	17
904	81	17
905	81	15
906	80	15
907	80	28
908	81	22
909	81	24
910	81	19
911	81	21
912	81	20
913	83	26
914	80	63
915	80	59
916	83	100
917	81	73
918	83	53
919	80	76
920	81	61
921	80	50
922	81	37
923	82	49
924	83	37
925	83	25
926	83	17
927	83	13
928	83	10
929	83	8
930	83	7
931	83	7
932	83	6
933	83	6
934	83	6
935	71	5
936	49	24
937	69	64
938	81	50
939	81	43
940	81	42
941	81	31
942	81	30
943	81	35
944	81	28
945	81	27
946	80	27
947	81	31

APPENDIX VI TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) COMPOSITE TRANSIENT
CYCLE—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
948	81	41
949	81	41
950	81	37
951	81	43
952	81	34
953	81	31
954	81	26
955	81	23
956	81	27
957	81	38
958	81	40
959	81	39
960	81	27
961	81	33
962	80	28
963	81	34
964	83	72
965	81	49
966	81	51
967	80	55
968	81	48
969	81	36
970	81	39
971	81	38
972	80	41
973	81	30
974	81	23
975	81	19
976	81	25
977	81	29
978	83	47
979	81	90
980	81	75
981	80	60
982	81	48
983	81	41
984	81	30
985	80	24
986	81	20
987	81	21
988	81	29
989	81	29
990	81	27
991	81	23
992	81	25
993	81	26
994	81	22
995	81	20
996	81	17
997	81	23
998	83	65
999	81	54
1000	81	50
1001	81	41
1002	81	35
1003	81	37
1004	81	29
1005	81	28
1006	81	24
1007	81	19
1008	81	16
1009	80	16
1010	83	23
1011	83	17
1012	83	13
1013	83	27

APPENDIX VI TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) COMPOSITE TRANSIENT
CYCLE—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
1014	81	58
1015	81	60
1016	81	46
1017	80	41
1018	80	36
1019	81	26
1020	86	18
1021	82	35
1022	79	53
1023	82	30
1024	83	29
1025	83	32
1026	83	28
1027	76	60
1028	79	51
1029	86	26
1030	82	34
1031	84	25
1032	86	23
1033	85	22
1034	83	26
1035	83	25
1036	83	37
1037	84	14
1038	83	39
1039	76	70
1040	78	81
1041	75	71
1042	86	47
1043	83	35
1044	81	43
1045	81	41
1046	79	46
1047	80	44
1048	84	20
1049	79	31
1050	87	29
1051	82	49
1052	84	21
1053	82	56
1054	81	30
1055	85	21
1056	86	16
1057	79	52
1058	78	60
1059	74	55
1060	78	84
1061	80	54
1062	80	35
1063	82	24
1064	83	43
1065	79	49
1066	83	50
1067	86	12
1068	64	14
1069	24	14
1070	49	21
1071	77	48
1072	103	11
1073	98	48
1074	101	34
1075	99	39
1076	103	11
1077	103	19
1078	103	7
1079	103	13

APPENDIX VI TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) COMPOSITE TRANSIENT
CYCLE—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
1080	103	10
1081	102	13
1082	101	29
1083	102	25
1084	102	20
1085	96	60
1086	99	38
1087	102	24
1088	100	31
1089	100	28
1090	98	3
1091	102	26
1092	95	64
1093	102	23
1094	102	25
1095	98	42
1096	93	68
1097	101	25
1098	95	64
1099	101	35
1100	94	59
1101	97	37
1102	97	60
1103	93	98
1104	98	53
1105	103	13
1106	103	11
1107	103	11
1108	103	13
1109	103	10
1110	103	10
1111	103	11
1112	103	10
1113	103	10
1114	102	18
1115	102	31
1116	101	24
1117	102	19
1118	103	10
1119	102	12
1120	99	56
1121	96	59
1122	74	28
1123	66	62
1124	74	29
1125	64	74
1126	69	40
1127	76	2
1128	72	29
1129	66	65
1130	54	69
1131	69	56
1132	69	40
1133	73	54
1134	63	92
1135	61	67
1136	72	42
1137	78	2
1138	76	34
1139	67	80
1140	70	67
1141	53	70
1142	72	65
1143	60	57
1144	74	29
1145	69	31

APPENDIX VI TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) COMPOSITE TRANSIENT
CYCLE—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
1146	76	1
1147	74	22
1148	72	52
1149	62	96
1150	54	72
1151	72	28
1152	72	35
1153	64	68
1154	74	27
1155	76	14
1156	69	38
1157	66	59
1158	64	99
1159	51	86
1160	70	53
1161	72	36
1162	71	47
1163	70	42
1164	67	34
1165	74	2
1166	75	21
1167	74	15
1168	75	13
1169	76	10
1170	75	13
1171	75	10
1172	75	7
1173	75	13
1174	76	8
1175	76	7
1176	67	45
1177	75	13
1178	75	12
1179	73	21
1180	68	46
1181	74	8
1182	76	11
1183	76	14
1184	74	11
1185	74	18
1186	73	22
1187	74	20
1188	74	19
1189	70	22
1190	71	23
1191	73	19
1192	73	19
1193	72	20
1194	64	60
1195	70	39
1196	66	56
1197	68	64
1198	30	68
1199	70	38
1200	66	47
1201	76	14
1202	74	18
1203	69	46
1204	68	62
1205	68	62
1206	68	62
1207	68	62
1208	68	62
1209	68	62
1210	54	50
1211	41	37

APPENDIX VI TO PART 1039.—
NONROAD COMPRESSION-IGNITION
(CI) COMPOSITE TRANSIENT
CYCLE—Continued

Time (s)	Normal- ized speed (percent)	Normal- ized torque (percent)
1212	27	25
1213	14	12
1214	0	0
1215	0	0
1216	0	0
1217	0	0
1218	0	0
1219	0	0
1220	0	0
1221	0	0
1222	0	0
1223	0	0
1224	0	0
1225	0	0
1226	0	0
1227	0	0
1228	0	0
1229	0	0
1230	0	0
1231	0	0
1232	0	0
1233	0	0
1234	0	0
1235	0	0
1236	0	0
1237	0	0
1238	0	0

PART 1065—TEST PROCEDURES AND EQUIPMENT

65. The authority citation for part 1065 continues to read as follows:

Authority: 42 U.S.C. 7401–7671(q).

66. Section 1065.1 is amended by revising paragraph (a) and removing and reserving paragraph (b)(6) to read as follows:

§ 1065.1 Applicability.

(a) This part describes the procedures that apply to testing that we require for the following engines or for equipment using the following engines:

(1) Large nonroad spark-ignition engines we regulate under 40 CFR part 1048.

(2) Vehicles that we regulate under 40 CFR part 1051 (*i.e.*, recreational SI vehicles) that are regulated based on engine testing. See 40 CFR part 1051 to determine which vehicles may be certified based on engine test data.

(3) Land-based nonroad compression-ignition engines we regulate under 40 CFR part 1039.

* * * * *

67. Section 1065.10 is amended by revising paragraph (c)(3) to read as follows:

§ 1065.10 Other test procedures.

* * * * *

(c) * * *

(3) You may ask to use alternate procedures that produce measurements equivalent to those from the specified procedures. If you send us a written request showing your procedures are equivalent, and we agree that they are equivalent, we will allow you to use them. You may not use an alternate procedure until we approve them, either by: Telling you directly that you may use this procedure; or issuing guidance to all manufacturers, which allows you to use the alternate procedure without additional approval. You may use the statistical procedures specified in 40 CFR 86.1306–07(d) to demonstrate equivalence.

* * * * *

68. Section 1065.115 is added to read as follows:

§ 1065.115 Exhaust gas sampling system; compression-ignition engines.

Use the exhaust-gas sampling system specified in 40 CFR 86.1310 to measure emissions from compression-ignition nonroad engines.

69. Section 1065.205 is added to read as follows:

§ 1065.205 Test fuel specifications for distillate diesel fuel.

Petroleum distillate diesel fuel used as a test fuel must meet the following specifications:

Item		ASTM test method No.	Type 2-D
(i) Cetane Number	D613	40–50
(ii) Cetane Index	D976	40–50
(iii) Distillation range:			
(A) IBP	°C	D86	171–204
(B) 10 pct. point	°C	D86	204–238
(C) 50 pct. point	°C	D86	243–282
(D) 90 pct. point	°C	D86	293–332
(E) EP	°C	D86	D321–366
(iv) Gravity	°API	D287	32–37
(v) Total sulfur	ppm	D2622	7–15
(vi) Hydrocarbon composition: (A) Aromatics, minimum (Remainder shall be paraffins, naphthenes, and olefins).	pct	D5186	10
(vii) Flashpoint, min.	°C	D93	54
(viii) Viscosity	centistokes	D445	2.0–3.2

70. Section 1065.310 is amended to read as follows:

§ 1065.310 CVS calibration.

Use the procedures of 40 CFR 86.1319–90 to calibrate the CVS.

71. Section 1065.405 is amended by revising paragraph (b) to read as follows:

§ 1065.405 Preparing and servicing a test engine.

* * * * *

(b) Run the test engine, with all emission-control systems operating, long enough to stabilize emission levels.

(1) For SI engines, if you accumulate 50 hours of operation, you may consider emission levels stable without measurement.

(2) For CI engines, if you accumulate 125 hours of operation, you may consider emission levels stable without measurement.

* * * * *

72. Section 1065.530 is amended by revising paragraph (b)(3)(iii) and Table 1 and adding a new Table 2 and paragraph (d) to read as follows:

§ 1065.530 Test cycle validation criteria.

* * * * *

(b) * * *

(3) * * *

(iii) For a valid test, make sure the feedback cycle's integrated brake kilowatt-hour is within 5 percent of the reference cycle's integrated brake kilowatt-hour. Also, ensure that the

slope, intercept, standard error, and coefficient of determination meet the

criteria in the following tables (you may delete individual points from the

regression analyses, consistent with good engineering judgment):

TABLE 1 OF § 1065.530.—STATISTICAL CRITERIA FOR VALIDATING TEST CYCLES FOR SPARK-IGNITION ENGINES

	Speed	Torque	Power
1. Slope of the regression line (m)	0.950 to 1.030	0.830 to 1.030	0.880 to 1.030.
2. Y intercept of the regression line (b).	$ b \leq 50$ rpm	$ b \leq 5.0$ percent of maximum torque from power map.	$ b \leq 3.0$ percent of maximum torque from power map.
3. Standard error of the estimate of Y on X (SE).	100 rpm	15 percent of maximum torque from power map.	10 percent of maximum power from power map.
4. Coefficient of determination (r^2)	$r^2 \geq 0.970$	$r^2 \geq 0.880$	$r^2 \geq 0.900$.

TABLE 2 OF § 1065.530.—STATISTICAL CRITERIA FOR VALIDATING TEST CYCLES FOR COMPRESSION-IGNITION ENGINES

	Speed	Torque	Power
1. Slope of the regression line (m)	0.950 to 1.030	0.830 to 1.030 (hot); 0.77 to 1.03 (cold).	0.890 to 1.030 (hot); 0.870 to 1.030 (cold).
2. Y intercept of the regression line (b).	$ b \leq 50$ rpm	$ b \leq 20$ Nm or $ b \leq 2.0$ percent of maximum torque from power map, whichever is greater.	$ b \leq 40$ kW or $ b \leq 3.0$ percent of maximum torque from power map, whichever is greater.
3. Standard error of the estimate of Y on X (SE).	100 rpm	13 percent of maximum torque from power map.	8 percent of maximum power from power map.
4. Coefficient of determination (r^2)	$r^2 \geq 0.970$	$r^2 \geq 0.880$ (hot); $r^2 \geq 0.850$ (cold)	$r^2 \geq 0.910$ (hot); $r^2 \geq 0.850$ (cold).

* * * * *

(d) *Transient testing with constant-speed engines.* For constant-speed engines with installed governor operating over a transient duty cycle, the test cycle validation criteria in this section apply to engine-torque values but not engine-speed values.

73. Section 1065.615 is amended by revising paragraphs (c) and (d) to read as follows:

§ 1065.615 Bag sample calculations.

* * * * *

(c) Calculate total brake work (kW-hr) done during the emissions sampling period of each segment or mode and then weight it by the applicable test cycle weighting factors.

(d) Calculate emissions in g/kW-hr by dividing the total weighted mass emission rate (g/test) by the total cycle-weighted brake work for the test.

* * * * *

74. Section 1065.620 is added to read as follows:

§ 1065.620 Continuous sample analysis and calculations.

Use the sample analysis procedures and calculations of 40 CFR subpart N for continuous samples.

75. Section 1065.701 is added to read as follows:

§ 1065.701 Particulate measurements.

Use the particulate sampling system and procedures specified in 40 CFR part 86 subpart N to measure particulate emissions from compression-ignition nonroad engines.

76. Section 1065.910 is revised to read as follows:

§ 1065.910 Measurement accuracy and precision.

Measurement systems used for field testing have accuracy and precision comparable to those of dynamometer testing. Measurement systems that conform to the provisions of §§ 1065.915 through 1065.950 are deemed to be in compliance with the accuracy and precision requirements of paragraph of this section. If you use other field testing measurement systems you need to have documentation indicating that it is comparable to a dynamometer system.

(a) The two systems must be calibrated independently to NIST traceable standards or equivalent national standards for this comparison. We may approve the use of other standards. Calculations of emissions results for this test should be consistent with the field testing data reduction scheme for both the in-use equipment and the dynamometer equipment, and each complete test cycle will be considered one "summing interval", Si as defined in the field-testing data reduction scheme.

(b) While other statistical analyses may be acceptable, we recommend that the comparison be based on a minimum of seven (7) repeats of colocated and simultaneous tests. Perform this comparison over the applicable steady-state and transient test cycles using an engine that is fully warmed up such that its coolant temperature is thermostatically controlled. If there is no applicable transient test cycle, use the applicable steady-state cycle. Anyone who intends to submit an

alternative comparison is encouraged to first contact EPA Office of Transportation and Air Quality, Assessment and Standards Division to discuss the applicant's intended statistical analysis. The Division may provide further guidance specific to the appropriate statistical analysis for the respective application.

(c) The following statistical tests are suggested. If the comparison is paired, it must demonstrate that the alternate system passes a two-sided, paired t-test. If the test is unpaired, it must demonstrate that the alternate system passes a two-sided, unpaired t-test. The average of these tests for the reference system must return results less than or equal to the applicable emissions standard. The t-test is performed as follows, where "n" equals the number of tests:

(1) Calculate the average of the in-use system results; this is Iavg .

(2) Calculate the average of the results of the system to which the in-use system was Referenced; this is Ravg .

(3) Calculate the "n - 1" standard deviations for the in-use and reference averages; these are Isd and Rsd respectively. Form the F ratio: $F = (\text{Isd} / \text{Rsd})^2$. F must be less than the critical F value, F_{crit} at a 95% confidence interval for "n - 1" degrees of freedom. Table 1 of this section lists 95% confidence interval F_{crit} values for n - 1 degrees of freedom. Note that n_A represents the number of alternate system samples, while n_R represents the number of reference system samples.

(4) For an unpaired comparison, calculate the t-value:

$$t_{\text{unpaired}} = (I_{\text{avg}} - R_{\text{avg}}) / ((I_{\text{sd}}^2 + R_{\text{sd}}^2) / n)^{1/2}$$

(5) For a paired comparison, calculate the “n – 1” standard deviation (squared) of the differences, d_i , between the paired results, where “i” represents the i th test of n number of tests:

$$S_D^2 = (Sd_i^2 - ((Sd_i)^2 / n)) / (n - 1)$$

(6) For a paired comparison, calculate the t-value:

$$t_{\text{paired}} = (I_{\text{avg}} - R_{\text{avg}}) / (S_D^2 / n)^{1/2}$$

(d) The absolute value of t must be less than the critical t value, t_{crit} at a 95% confidence interval for “n – 1” degrees of freedom. Table 2 of this section lists 95% confidence interval t_{crit} values for $n - 1$ degrees of freedom.

TABLE 1 OF § 1065.910.—95% CONFIDENCE INTERVAL CRITICAL F VALUES FOR F-TEST

nR – 1	nl – 1	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
6	4.284	4.207	4.147	4.099	4.06	4.027	4	3.976	3.956	3.938	3.922	3.908	3.896	3.884	3.874
7	3.866	3.787	3.726	3.677	3.637	3.603	3.575	3.55	3.529	3.511	3.494	3.48	3.467	3.455	3.445
8	3.581	3.5	3.438	3.388	3.347	3.313	3.284	3.259	3.237	3.218	3.202	3.187	3.173	3.161	3.15
9	3.374	3.293	3.23	3.179	3.137	3.102	3.073	3.048	3.025	3.006	2.989	2.974	2.96	2.948	2.936
10	3.217	3.135	3.072	3.02	2.978	2.943	2.913	2.887	2.865	2.845	2.828	2.812	2.798	2.785	2.774
11	3.095	3.012	2.948	2.896	2.854	2.818	2.788	2.761	2.739	2.719	2.701	2.685	2.671	2.658	2.646
12	2.996	2.913	2.849	2.796	2.753	2.717	2.687	2.66	2.637	2.617	2.599	2.583	2.568	2.555	2.544
13	2.915	2.832	2.767	2.714	2.671	2.635	2.604	2.577	2.554	2.533	2.515	2.499	2.484	2.471	2.459
14	2.848	2.764	2.699	2.646	2.602	2.565	2.534	2.507	2.484	2.463	2.455	2.428	2.413	2.4	2.388
15	2.79	2.707	2.641	2.588	2.544	2.507	2.475	2.448	2.424	2.403	2.385	2.368	2.353	2.34	2.328
16	2.741	2.657	2.591	2.538	2.494	2.456	2.425	2.397	2.373	2.352	2.333	2.317	2.302	2.288	2.276
17	2.699	2.614	2.548	2.494	2.45	2.413	2.381	2.353	2.329	2.308	2.289	2.272	2.257	2.243	2.23
18	2.661	2.577	2.51	2.456	2.412	2.374	2.342	2.314	2.29	2.269	2.25	2.233	2.217	2.203	2.191
19	2.628	2.544	2.477	2.423	2.378	2.34	2.308	2.28	2.256	2.234	2.215	2.198	2.182	2.168	2.155
20	2.599	2.514	2.447	2.393	2.348	2.31	2.278	2.25	2.225	2.203	2.184	2.167	2.151	2.137	2.124

TABLE 2 OF § 1065.910.—95% CONFIDENCE INTERVAL CRITICAL T VALUES FOR T-TEST

n – 1	t_{crit}
6	2.45
7	2.36
8	2.31
9	2.26
10	2.23
11	2.20
12	2.18
13	2.16
14	2.14
15	2.13
16	2.12
17	2.11
18	2.10
19	2.09
20	2.09

PART 1068—GENERAL COMPLIANCE PROVISIONS FOR NONROAD PROGRAMS

77. The authority citation for part 1068 continues to read as follows:

Authority: 42 U.S.C. 7401–7671(q).

78. Section 1068.1 is amended by revising paragraph (a), removing and reserving paragraph (b)(5), and adding paragraph (e) to read as follows:

§ 1068.1 Does this part apply to me?

(a) The provisions of this part apply to everyone with respect to the following engines and to equipment using the following engines (including owners, operators, parts manufacturers, and persons performing maintenance).

(1) Large nonroad spark-ignition engines we regulate under 40 CFR part 1048.

(2) Recreational SI engines and vehicles that we regulate under 40 CFR part 1051 (such as snowmobiles and off-highway motorcycles).

(3) Land-based nonroad diesel engines that we regulate under 40 CFR part 1039.

* * * * *

(e)(1) The provisions of §§ 1068.30, 1068.310, and 1068.320 apply for stationary spark-ignition engines beginning January 1, 2004, and for stationary compression-ignition engines beginning January 1, 2006.

(2) The provisions of §§ 1068.30 and 1068.235 apply for the types of engines listed in paragraph (a) of this section beginning January 1, 2004, where they are used solely for competition.

79. Section 1068.27 is added to read as follows:

§ 1068.27 May EPA conduct testing with my production engines?

If we request it, you must make a reasonable number of production-line engines available for a reasonable time so we can test or inspect them for compliance with the requirements of this chapter.

80. Section 1068.30 is amended by adding in alphabetical order a definition of “Aftertreatment” to read as follows:

§ 1068.30 What definitions apply to this part?

* * * * *

Aftertreatment means relating to any system, component, or technology mounted downstream of the exhaust

valve or exhaust port whose design function is to reduce exhaust emissions.

* * * * *

81. Section 1068.101 is amended by revising paragraph (a)(1) and adding paragraph (b)(6) to read as follows:

§ 1068.101 What general actions does this regulation prohibit?

(a) * * *

(1) You may not sell, offer for sale, or introduce or deliver into commerce in the United States or import into the United States any new engine or equipment after emission standards take effect for that engine or equipment, unless it has a valid certificate of conformity for its model year and the required label or tag. You also may not take any of the actions listed in the previous sentence with respect to any equipment containing an engine subject to this part’s provisions, unless the engine has a valid and appropriate certificate of conformity and the required engine label or tag. For purposes of this paragraph (a)(1), an appropriate certificate of conformity is one that applies for the same model year as the model year of the equipment (except as allowed by § 1068.105(a)), covers the appropriate category of engines (such as locomotive or CI marine), and conforms to all requirements specified for equipment in the standard-setting part. This requirements of this paragraph (a)(1) also cover new engines you produce to replace an older engine in a piece of equipment, unless the engine qualifies for the replacement-engine exemption in § 1068.240. We may assess a civil

penalty up to \$31,500 for each engine in violation.

* * * * *

(b) * * *

(6) You must meet your obligation to honor your emission-related warranty under § 1068.115 and to fulfill any applicable responsibilities to recall engines under § 1068.505. Failure to meet these obligations is prohibited. We may assess a civil penalty up to \$31,500 for each engine in violation.

* * * * *

82. Section 1068.105 is amended by adding introductory text and revising paragraph (c) to read as follows:

§ 1068.105 What other provisions apply to me specifically if I manufacture equipment needing certified engines?

This section describes general provisions that apply to equipment manufacturers. See the standard-setting part for any requirements that apply for certain applications.

* * * * *

(c) *Attaching a duplicate label.* If you obscure the engine's label, you must do four things to avoid violating § 1068.101(a)(1):

(1) Send a request for duplicate labels in writing with your company's letterhead to the engine manufacturer. Include the following information in your request:

(i) Identify the type of equipment and the specific engine and equipment models needing duplicate labels.

(ii) Identify the engine family (from the original engine label).

(iii) State the reason that you need a duplicate label for each equipment model.

(iv) Identify the number of duplicate labels you will need.

(2) Permanently attach the duplicate label to your equipment by securing it to a part needed for normal operation and not normally requiring replacement. Make sure an average person can easily read it.

(3) Destroy any unused duplicate labels if you find that you will not need them.

(4) Keep the following records for at least eight years after the end of the model year identified on the engine label:

(i) Keep a copy of your written request.

(ii) Keep drawings or descriptions that show how you apply the duplicate labels to your equipment.

(iii) Maintain a count of duplicate labels that you use or destroy.

* * * * *

83. Section 1068.210 is amended by revising paragraph (a) to read as follows:

§ 1068.210 What are the provisions for exempting test engines?

(a) We may exempt engines that are not exempted under other sections of this part that you will use for research, investigations, studies, demonstrations, or training. This may include engines placed into service if the primary purpose is to develop a fundamentally new emission-control technology related either to an alternative fuel or an aftertreatment device.

* * * * *

84. Section 1068.215 is amended by revising paragraph (c)(3)(iii) to read as follows:

§ 1068.215 What are the provisions for exempting manufacturer-owned engines?

* * * * *

(c) * * *

(3) * * *

(iii) Engine displacement, engine family identification (as applicable), and model year of the engine or whom to contact for further information.

* * * * *

85. Section 1068.220 is amended by revising paragraph (e)(3) to read as follows:

§ 1068.220 What are the provisions for exempting display engines?

* * * * *

(e) * * *

(3) Engine displacement, engine family identification (as applicable), and model year of the engine or whom to contact for further information.

* * * * *

86. Section 1068.310 is amended by revising the introductory text and paragraphs (a) and (b) to read as follows:

§ 1068.310 What are the exclusions for imported engines?

Engines or equipment that are not subject to our emission standards are not subject to the restrictions on imports in § 1068.301(b). If you show us that your engines qualify under one of the paragraphs of this section, we will approve your request to import such excluded engines. You must have our approval to import an engine under paragraph (a) of this section. You may, but are not required to request our approval to import the engines under paragraph (b) or (c) of this section. The following engines are excluded:

(a) *Engines used solely for competition.* Engines you use solely for competition are generally excluded from the restrictions on imports in § 1068.301(b), but only if they are properly labeled according to § 1068.320. The standard-setting part may set special provisions for the manufacture, sale, or import of engines

used solely for competition. Section 1068.101(b)(4) prohibits using these excluded engines for other purposes.

(b) *Stationary engines.* The definition of nonroad engine in 40 CFR 1068.30 does not include certain engines used in stationary applications. Such engines are not subject to the restrictions on imports in § 1068.301(b), but only if they are properly labeled according to § 1068.320. Section 1068.101 restricts the use of stationary engines for non-stationary purposes.

* * * * *

87. Section 1068.315 is amended by revising introductory text and paragraph (a) and adding paragraph (f)(1)(iii) to read as follows:

§ 1068.315 What are the permanent exemptions for imported engines?

We may approve a permanent exemption from the restrictions on imports under § 1039.301(b) under the following conditions:

(a) *National security exemption.* You may import an engine under the national security exemption in § 1068.225, but only if they are properly labeled according to § 1068.320.

* * * * *

(f) * * *

(1) * * *

(iii) Land-based nonroad diesel engines (see part 1039 of this chapter).

* * * * *

88. Section 1068.320 is amended by revising the section heading, paragraph (a) introductory text, and paragraph (b)(4) to read as follows:

§ 1068.320 How must I label an imported engine with an exclusion or a permanent exemption?

(a) For engines imported under § 1068.310(a) or (b) or § 1068.315(a), you must place a permanent label or tag on each engine. If no specific label requirements from the standard-setting part or from subpart C of this part apply, you must meet the following requirements:

* * * * *

(b) * * *

(4) State:

THIS ENGINE IS EXEMPT FROM THE REQUIREMENTS OF [identify the part referenced in 40 CFR 1068.1(a) that would otherwise apply], AS PROVIDED IN [identify the paragraph authorizing the exemption (for example, "40 CFR 1068.315(a)"]]. INSTALLING THIS ENGINE IN ANY DIFFERENT APPLICATION MAY BE A VIOLATION OF FEDERAL LAW SUBJECT TO CIVIL PENALTY.

* * * * *

89. Section 1068.325 is amended by revising the introductory text to read as follows:

§ 1068.325 What are the temporary exemptions for imported engines?

If we approve a temporary exemption from the restrictions on importing an engine under § 1039.301(b), you may import it under the conditions in this section. We may ask the U.S. Customs Service to require a specific bond amount to make sure you comply with the requirements of this subpart. You may not sell or lease one of these engines while it is in the United States. You must eventually export the engine as we describe in this section unless you get a certificate of conformity for it or it qualifies for one of the permanent exemptions in § 1068.315. Section 1068.330 specifies an additional temporary exemption allowing you to import certain engines you intend to sell or lease.

* * * *

90. A new § 1068.340 is added to read as follows:

§ 1068.340 What special provisions apply to Independent Commercial Importers?

We generally consider engines to be new when they are imported into the United States, even if they have previously been used outside the country. See 40 CFR part 89, subpart G and 40 CFR 89.906(b) for special provisions allowing Independent Commercial Importers to show that such engines meet the requirements of the standard-setting part without the full certification process.

91. Section 1068.501 is amended by revising paragraphs (b), (c)(1), (e), (f), and (h), and adding paragraph (a)(7) to read as follows:

§ 1068.501 How do I report engine defects?

(a) * * *

(7) This section distinguishes between defects and possible defect. A possible defect occurs anytime there is an indication that an emission-related component might have a defect, as described in paragraph (b)(1) of this section.

(b) *Investigation of possible defects.* If the number of engines that have a possible defect, as defined by paragraph (b)(1) of this section, exceed the thresholds specified in paragraph (e) of this section, you must conduct an investigation to determine if an emission-related component is actually defective.

(1) You must track warranty claims, parts shipments, and the other information specified in paragraph

(b)(1)(iii) of this section. You must classify an engine component as having a possible defect if any of the following is true:

(i) A warranty claim is submitted for the component, whether this is under your emission-related warranty or any other warranty.

(ii) You ship a replacement component other than for normally scheduled maintenance during the useful life of the engine.

(iii) You receive any other information indicating the component may be defective, such as information from dealers or hot line complaints.

(2) Your investigation must be prompt, thorough, consider all relevant information, follow scientific and engineering principles, and be designed to obtain all the information specified in paragraph (d) of this section.

(3) Your investigation only needs to consider possible defects that occur within the useful life period, or within five years after the end of the model year, whichever is longer.

(4) You must continue your investigation until you are able to show that components are not defective or you obtain all the information specified for a defect report in paragraph (d) of this section. Send us an updated defect report anytime you have significant additional information.

(5) If a component with a possible defect is used in additional engine families or model years, you must investigate whether the component or part may be defective when used in these additional engine families or model years, and include these results in any defect report you send under paragraph (c) of this section.

(6) If your initial investigation concludes that the number of engines with a defect is fewer than the thresholds specified in paragraph (f) of this section, but other information later becomes available that may show that the number of engines with a defect exceeds these thresholds, then you must resume your investigation. If you resume an investigation, you must include the information from the earlier investigation to determine whether to send a defect report.

(c) * * *

(1) Your investigation shows that the number of engines with a defect exceeds the thresholds specified in paragraph (f) of this section. Send the defect report within 15 days after the date you identify this number of defective engines. See paragraph (h) of this section for reporting requirements that apply if the number of engines with a

defect does not exceed the thresholds in paragraph (f) of this section.

* * * *

(e) *Thresholds for conducting a defect investigation.* Unless the standard-setting part specifies otherwise, you must begin a defect investigation based on the following threshold values:

(1) For engine with rated power under 560 kW:

(i) When the component is a catalytic converter (or other aftertreatment device), for one of the following number of engines that may have the defect:

(A) For engine families with annual sales below 4,000 units: 20 or more engines.

(B) For engine families with annual sales between 4,000 and 100,000 units: more than 2 percent of the total number of engines in the engine family.

(C) For engine families with annual sales above 100,000 units: 2,000 or more engines.

(ii) When the emission-related component is anything but a catalytic converter (or other aftertreatment device), for one of the following number of engines that may have the defect:

(A) For engine families with annual sales below 4,000 units: 40 or more engines.

(B) For engine families with annual sales between 4,000 and 100,000 units: more than 4 percent of the total number of engines in the engine family.

(C) For engine families with annual sales above 100,000 units: 4,000 or more engines.

(2) For engine with rated power greater than or equal to 560 kW, if the number of engines in an engine family that may have the defect exceeds 1 percent of the total number of engines in the engine family or 5 engines, whichever is greater.

(f) *Thresholds for filing a defect report.* You must send a defect report based on the following threshold values:

(1) For engine with rated power under 560 kW:

(i) When the component is a catalytic converter (or other aftertreatment device), for one of the following number of engines that may have the defect:

(A) For engine families with annual sales below 4,000 units: 5 or more engines.

(B) For engine families with annual sales between 4,000 and 100,000 units: more than 0.125 percent of the total number of engines in the engine family.

(C) For engine families with annual sales above 100,000 units: 125 or more engines.

(ii) When the emission-related component is anything but a catalytic converter (or other aftertreatment

device), for one of the following number of engines that may have the defect:

(A) For engine families with annual sales below 4,000 units: 10 or more engines.

(B) For engine families with annual sales between 4,000 and 100,000 units: more than 0.250 percent of the total number of engines in the engine family.

(C) For engine families with annual sales above 100,000 units: 250 or more engines.

(2) For engine with rated power greater than or equal to 560 kW, if the number of engines in an engine family that has the defect exceeds 0.5 percent of the total number of engines in the engine family or 2 engines, whichever is greater.

* * * * *

(h) *Investigation reports.* If you investigate possible defects under paragraph (b) of this section and find that the number of engines with a defect

does not exceed the thresholds specified in paragraph (f) of this section, you must send us a report supporting this conclusion. Include the information specified in paragraph (d) of this section, or explain why the information is not relevant. Send this report within 15 days after the date you reach this conclusion.

* * * * *

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